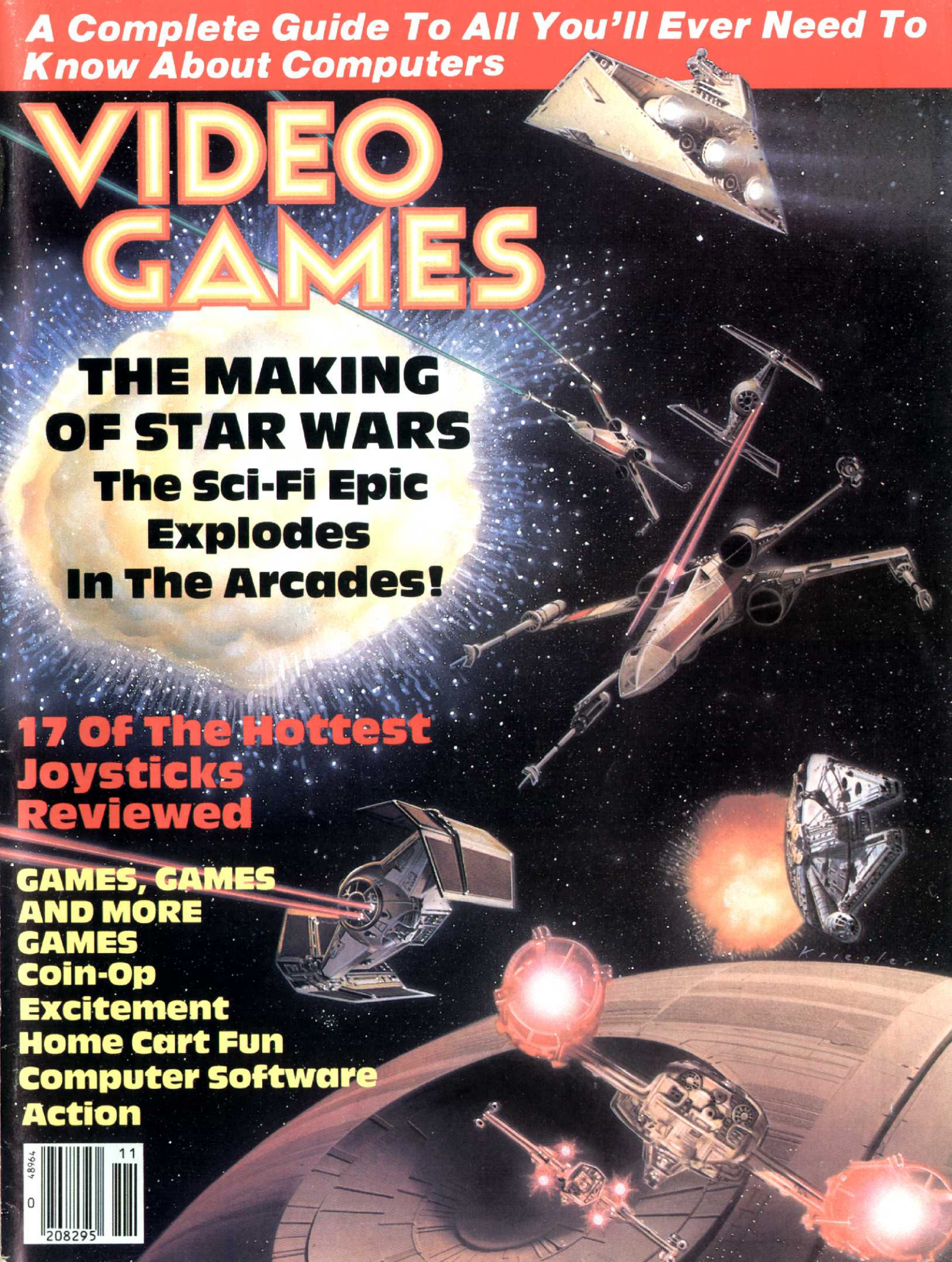
A Complete Guide To All You'll Ever Need To Know About Computers

VIDEO GAMES



THE MAKING OF STAR WARS
The Sci-Fi Epic Explodes In The Arcades!

17 Of The Hottest Joysticks Reviewed

GAMES, GAMES AND MORE GAMES
Coin-Op Excitement
Home Cart Fun
Computer Software Action

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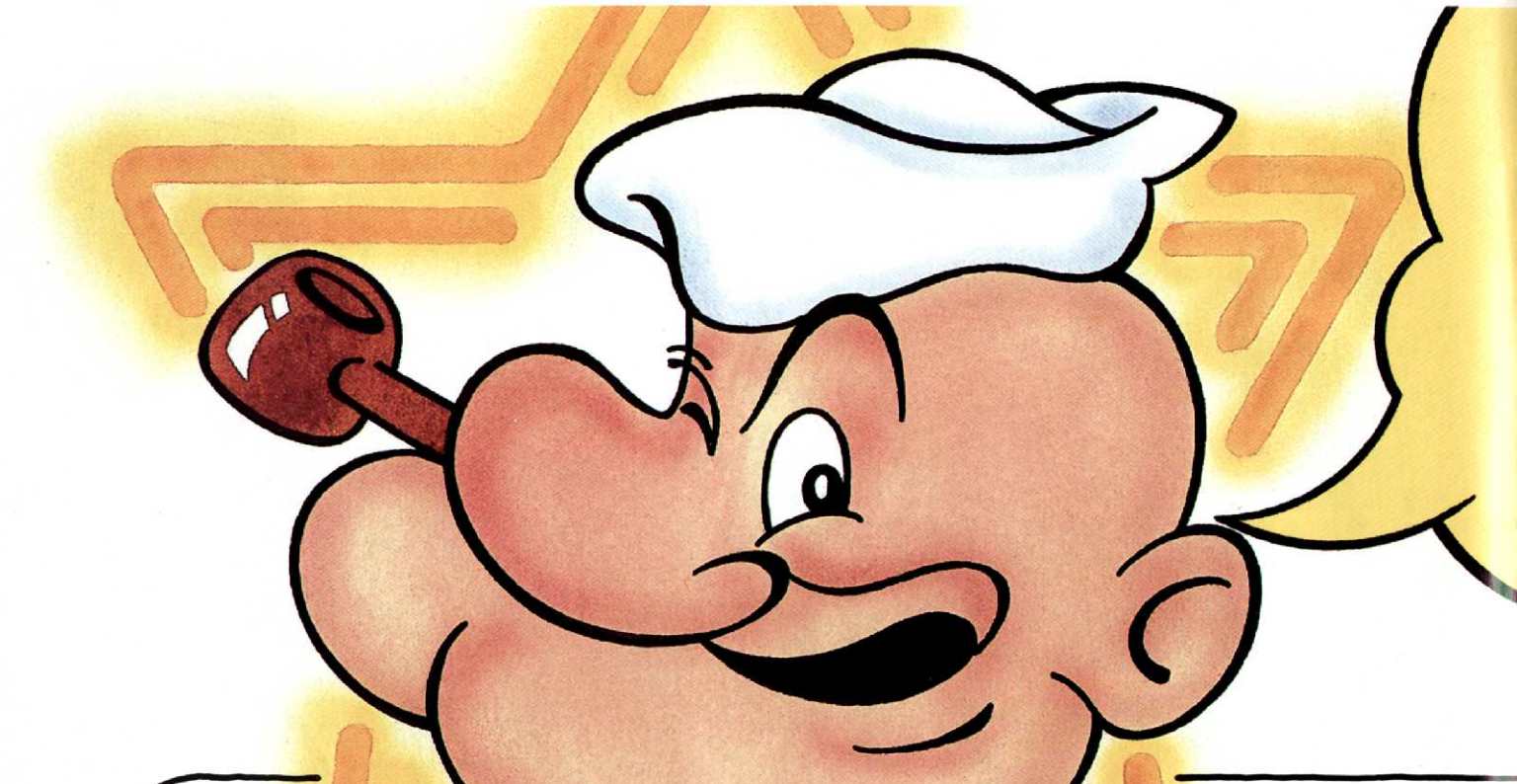
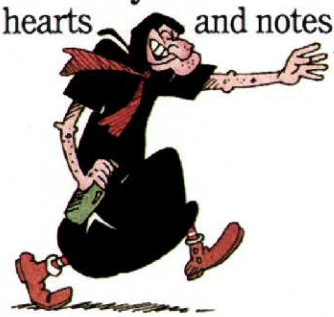


Popeye The Sailor Man

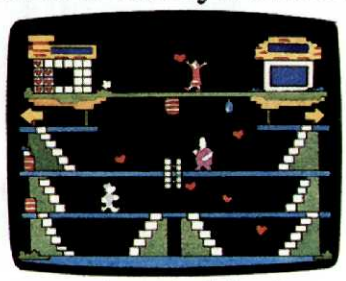
Yo gotsta capture Olive's hearts. Or else.

You thinks it's all fun and games bein the woild's most famousk sailor? Then, I suggests you tries it yerself.

You try makin points with Olive Oyl, that fickle, damanding, stringbean of a dame. Likes you got nothin better to do than runnin around tryin to catch her hearts and notes.



You try bein chased around by that fat swab Brutusk, without a chance to catch yer breath.



As soon as yo gets yer spinach, they all runs away.

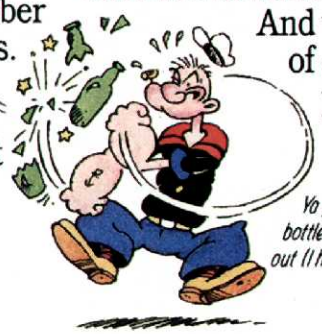
And I'll tells ya, that big blubber ball ain't as dumb as he looks.

You try doin all that whilst yer gettin pelted with beer bottles by that discustipatin Sea Hag. She ain't no lady, that's fer sure.

And you try fightin off the vultures whilst Olive screams for H-E-L-P.

And you try to keep from gettin yerself killed by them bouncin skulls. I doesn't know where they comes from, but I doesn't like 'em one bit.

And woist of all, whilst you're doing all this,



Yo gotsta punch out these bottles before they punch you out (I hopes they're non-return).

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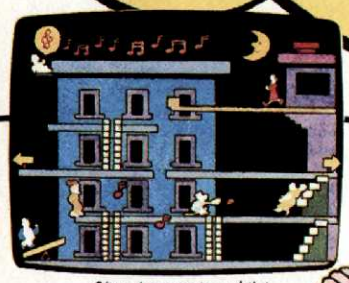
YA CAN'T BE WIMPY IF YA WANTS TA PLAY POPEYE.®



Olive drops notes whilst you runs around tryin to make points.

Ya thinks itsk fun tanglin with Brutusk? You try it.

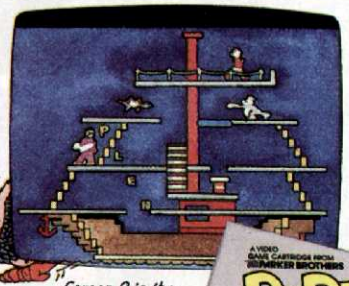
they keeps movin the spinach around so's you can never find it when you needs it. Blow me down, it ain't hardly fair.

I'll tell ya, ya gotsta be some kinda sailor to play Popeye.®

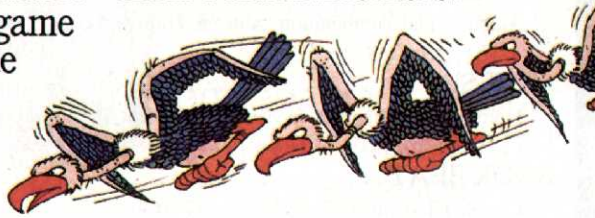
You gotsta be fast. And ya gotsta thrive under pressure.

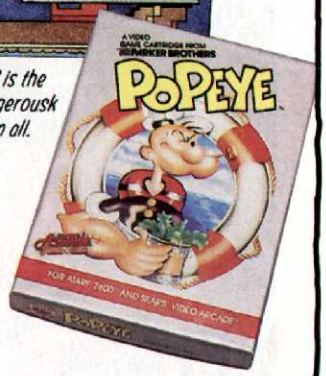
Cuz, me home video game is just like the hit arcade game by Nintendo... With three screens of non-stop action and incredulous graphics. So's if it's a challenge yer lookin for, and ya thinks ya gots what it takes, why be messin around with them other silly games. Do what I does every day. Play Popeye from Parker Brothers.

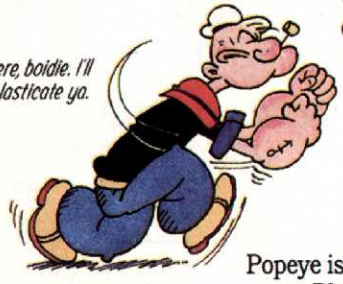
Just one piece of advice. I doesn't suggest ya tries it if ya eats yer spinach in a quiche.



Screen 3 is the most dangerousk of them all.







Here, boidie. I'll blasticate ya.

®PARKER BROTHERS

Popeye is available for Atari 2600, Intellivision, Atari 5200 and ColecoVision Systems; Plus Atari 400 and 800 and Commodore VIC 20 home computer systems.

VIDEO GAMES

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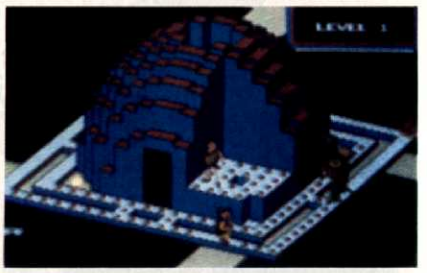

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BUMP 'N' JUMP.™* THE VIDEO GAME FOR PEOPLE WHO SHOULDN'T BE ALLOWED TO DRIVE.

For those of you who spend more time crashing than you do driving, we'd like to introduce Bump'N'Jump. The home video game where it's not just okay to hit the other cars, it's required.

Shown on Intellivision. Game varies by system.

Your job is to crash as many cars as you can without crashing yourself. And to help you do it, you're given some unusual options. Not only can you bump them off the road, you can jump over what you can't bump.

But even with these advantages, you're not on easy street. Because waiting somewhere down the road might be the deadly dump trucks. Or the treacherous tanks. Or the sinister death car. When you play Bump'N'Jump, you just never know who you'll run into.

Coming soon for Intellivision® and Atari® 2600.

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Bump'n'Jump™*

FROM MATTEL ELECTRONICS®

VIDEO GAMES

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HYPERSPACE

Well here we are, rapidly approaching the end of yet another year. In looking back it has been a remarkable time filled with an incredible variety of events. We witnessed the emergence of new technologies and applications in both arcade as well as home video game entertainment, with more still in sight before 1983 comes to a close.

Interestingly, the resulting trends have indicated a definite switch over to personal computers, although game playing systems aren't dead by any stretch of the imagination. Admittedly, there is a far greater array in new computer models as well as available software, but game systems are getting just as much play, if not more, given the amount of titles introduced back at the CES convention and scheduled for release before the holidays.

One area of game systems which is becoming increasingly important is replacement joysticks and controllers. Since totally new systems aren't prevalent, the next best thing has been an effort to embellish and enhance what you already have. To give you a better handle on the situation as it now exists, Video Games' associate editor Perry Greenberg produced a definitive look at seventeen joysticks and controllers (page 30), putting each to the test and reporting his results.

Regarding movement in the home computer market, in the past few issues of VG we've featured the newest models and decided, this time around, to pull together a very special section you're going to want to save if you already own a personal computer, or are planning on buying one in the near future. "Welcome to the Computer Age" begins on page 39 and provides comprehensive information and guidelines on everything you'll ever need to know about personal computers.

On other fronts, there's a fascinating process behind the development of any coin-op video game which most people in the 'outside' world never get a chance to see. Having personally gone through the demands inherent in designing a game, I thought that VG readers might be interested to read about the different aspects involved in getting a game to the marketplace. We're pleased to present the people behind the scenes in "The Making of Star Wars: the video game" (page 32) and the story of how this standout Atari attraction was created. It's the kind of exclusive feature coverage you can expect in upcoming issues of Video Games.

We're also trying to keep you ahead of the game with all the latest breaking news and developments in terms of reviews for arcade machines, home carts and computer software. In addition, some advance tips include being on the look out for a number of laserdisc/coin-op games such as Gottlieb/Mylstar's MACH 3 which began test marketing in mid-August, and more than half a dozen other models which should be coming your way before the end of the year. Also, on August 26th it was officially announced that Bally Manufacturing Corp. has purchased Sega Enterprises. So stay tuned for more on this.

In closing this month's editorial, let me state our intention to keep you better informed of this new era in coin-op video games better than any other publication around. So get ready for the excitement and the events that are about to unfold in the wonderful and wonderous world of video games and keep checking us out to see if you don't agree that VG is delivering all the news and happenings.

Roger C. Sharpe

PITSTOP™
WHERE WINNING IS THE PITS.

You'll never make Grand Prix champion just driving in circles.

You've got to stop sometime. The question is when. Right now you're in the lead. But the faster you go, the more gas you consume. And the quicker your tires wear down.

If you do pull into the pits, though, you lose precious seconds. So it's up to you to make sure the pit crew is quick with those tires. And careful with that gas. Otherwise, poof! you're out of the race.

See your retailer for available computer formats.

So what'll it be, Mario? Think your tires will hold up for another lap? Or should you play it safe and go get some new ones?

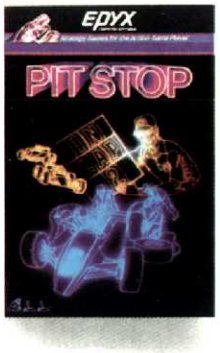
Think it over. Because Pitstop™ is the one and only road race game where winning is more than just driving. It's the pits.

Goggles not included.

One or two players; 6 racecourses, joystick control.

EPYX COMPUTER SOFTWARE

STRATEGY GAMES FOR THE ACTION-GAME PLAYER.



Double Speak

We Stand Corrected

I enjoy reading your magazine very much. However, I noticed two mistakes in your July issue, in your Double Speak column. First off concerning the record for most hours on one game is indeed 74 hours by Donnie Norris of Wilmington N.C., but it was done on Joust (old Chip) not Q*bert as stated. Also you said the high score on Joust (new chip) was 33,167,250 which was also correct, except that it was done by a Bob Weiss of San Jose, Calif., not by a Ben Weiss as you stated. I'm glad to help out a fantastic magazine.

Connel McCrohan
Dallas, Tx.

Calling All Gamers

In the September issue you reported that the ColecoVision Super Game Module would be out this year. To set the information straight it will be debuting the earliest by summer '84. I've gathered this information from the ColecoVision Hotline and confirmed it with spokespeople there. Should any readers like more info on the ColecoVision system they can call the Hotline by dialing 1-800-842-1225. You have a great magazine. I've been following *Video Games* since the premiere issue—keep those good issues coming!

Daniel Lew
Northbrook, Ill.

ColecoVisioned

After reading many articles about ColecoVision, the 5200, the 2600, Vectrex, Intellivision, Odyssey and Astrocade as well as my experience with ColecoVision, there is no doubt in my mind that it is the very best system. I know of over 65 ColecoVision compatible cartridges that are either in release or will be out shortly from such prominent manufacturers as Imagic, CBS, Starpath, Sirius and Parker Brothers. Game titles include arcade hits like Frontline, Time Pilot, Omega Race, Subroc-3D and Mr. Do! ColecoVision is also first with their expansion modules. They now have the 2600 adapter and driving controllers and will soon release their Roller Controller with the Centipede-like Slither and an incredible new joystick for use with their new line of sports games. Now that all of the facts are clear—and in the open—it is obvious ColecoVision is number one.

Jeff Gayton
Huntington Beach, Calif.

Laser Beams

In your September issue on page 44, you discussed the Video Technology Laser 2001 and the Laser 3000. I would appreciate reading in one of your future issues an article on both computers, describing their good points and bad points, as well.

Michael Lipson
Essex Junction, Vt.

We're working on that right now and hope to have both models reviewed in Hard Sell before too long.—Ed.

Exit the Dragon

After reading your enthusiastic review of "Dragon's Lair," (July, 1983) I was looking forward to playing it. However, now that I've played it, I have found it a great disappointment. I will give "Dragon's Lair" credit for its unbelievable video imagery, but I have never before experienced such video violence! Something about the joystick control was nervewracking, the conflicts and settings of the game were "creepy," and my friends and I were all mortified at the on-screen gore when I made a wrong move and "died." My opinion is, despite the superb graphics, "Dragon's Lair" is a disgusting game, an overly-gory game, and a good shot for anyone debating that video games contain too much violence. To think I lost a game of "Pole Position" for that!

Esme Codell
Chicago, Illinois

The Great Debate Continues

In response to a letter in the September issue that says the Atari 5200 is the best and most promising system around. What about ColecoVision? I think ColecoVision should be given equal space illustrating that it is the best. In addition to releasing ADAM, the family computer, Coleco will also be coming out with Roller Controller, packaged with Slither. Another thing to look for is Coleco's new Super Action Controllers. These include a 3-D game called Super Action Baseball. Now after reading this I hope you'll agree that ColecoVision is the *only* system you'll ever need!

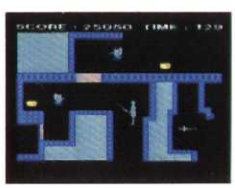
Joseph Venezia
Miami, Fla.

And Continues . . .

I want to say that your magazine is great and thank you for reviewing ColecoVision games. In the August issue, however an Atari 5200 fan was "blasting" your magazine for the coverage given ColecoVision and practically none for the 5200. He also stated the 5200 video game systems were in more homes than ColecoVision. Well, Mr. Baime, explain to me why Coleco Industries just sold their one-millionth unit several weeks ago, when the 5200 hasn't even come close. When the Super Game Module comes out with such games as Super Zaxxon, Super Donkey Kong, and Super Buck Rogers then we'll see who will be drooling over which system.

Warren (Cat) Radovich
Spring Valley, New York

WELCOME TO APSHAI. YOU'RE JUST IN TIME FOR LUNCH.



Boy, have you taken a wrong turn. One moment you're gathering treasure and the next you're being eyed like a side of beef.

You're in the Gateway to Apshai.™ The new cartridge version of the Computer Game of the Year,* Temple of Apshai.™

Gateway has eight levels. And over 400 dark, nasty chambers to explore. And because it's joystick controlled, you'll have to move faster than ever.

But first you'll have to consider your strategy. Is it treasure you're after? Or glory? You'll live longer if you're greedy, but slaying monsters racks up a higher score.

The Apshai series is the standard by which all other adventure games are judged. And novices will not survive.

They'll be eaten.

One player; Temple of Apshai, disk/cassette; Gateway to Apshai, cartridge, joystick control.

EPYX COMPUTER SOFTWARE

STRATEGY GAMES FOR THE ACTION-GAME PLAYER.

*Game Manufacturers Association, 1981

BLIPS

The Junkmen Cometh

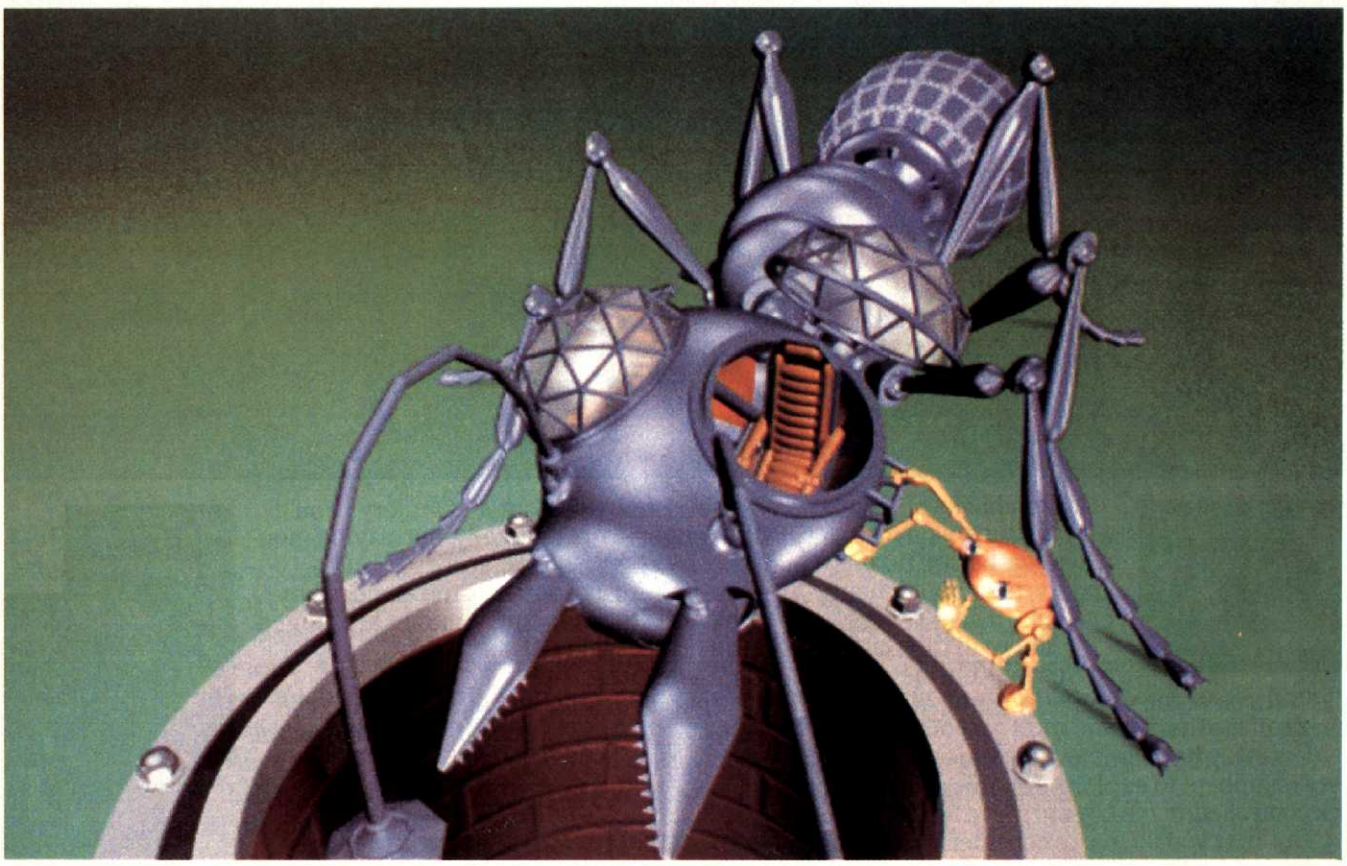
A dozen or so little plastic-and-metal robots grin down at visitors from their perch atop Lance Williams' office file cabinet. "Junkmen," he calls them. All are hand-built from assorted household doo-dads such as toy truck wheels, metal cylinders and Lincoln Logs. Robots have always fascinated Williams, so much so that he has made them his life's work. But the kind of robot this designer builds is meant neither for industry nor the home hobbyist. You cannot touch Williams' robots, feel their shiny steel suits, or watch them move laboriously across a room on motorized legs. Williams' robots exist only in his own mind — and in the memory of a computer.

"Sometimes we scare ourselves with some of the figures we invent here," he admits. Williams is senior research scientist and software designer at the New York Institute of Technology's computer Graphics Lab located on Long Island's North Shore. For nearly 25 years, the Lab has led the world in the development of super-sophisticated computer animation technology. For the last five years, it has been Williams' grueling task to bring computer-generated animation to its highest possible art form — to produce an entire motion picture inside a machine.

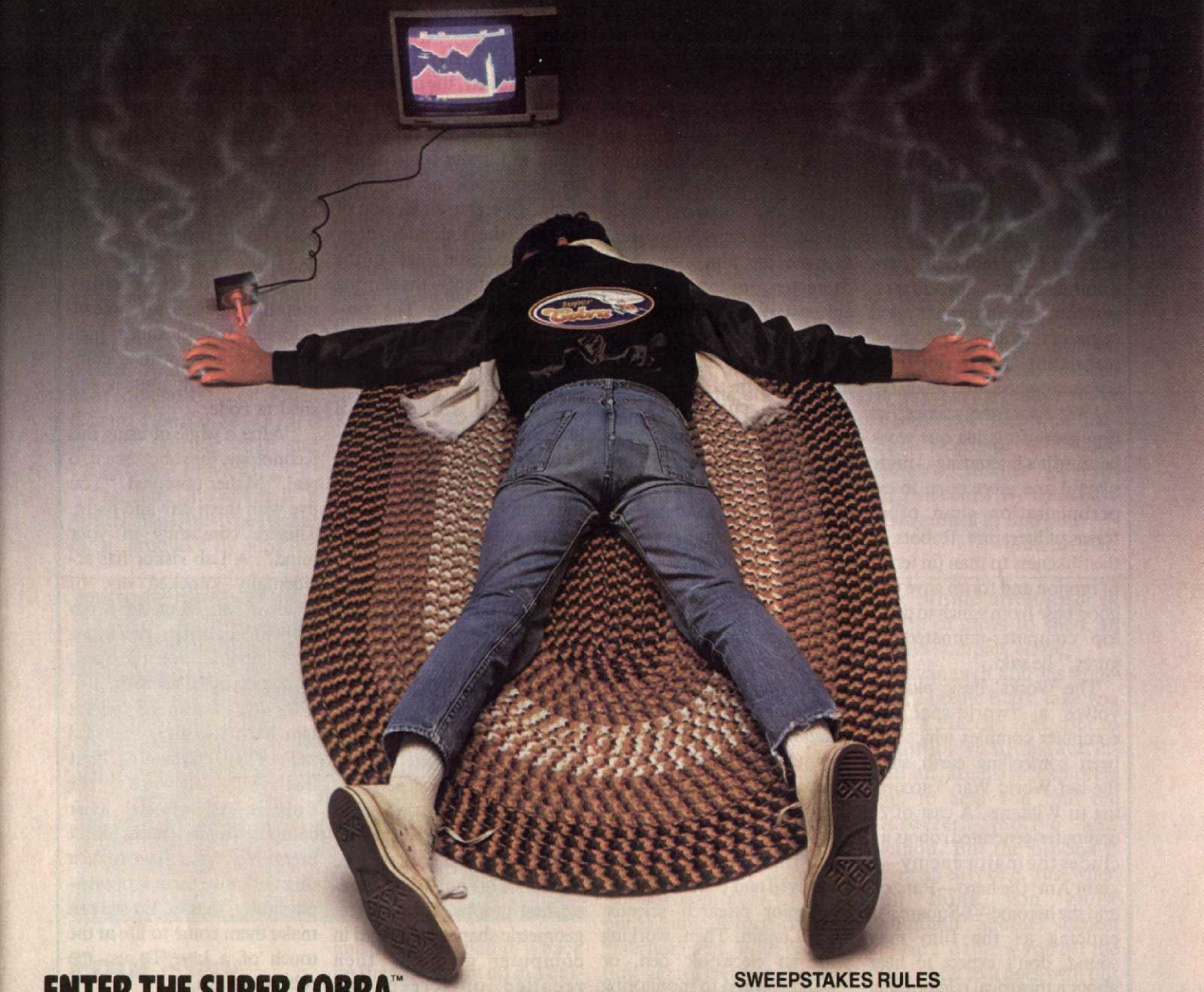
"Our mission since 1978 has been to develop the capacity, that is, the hardware and the software, that will eventually allow the film industry to create movies completely by computer, including exterior sets such as simulated landscapes and interiors similar to those seen in *TRON*. And finally, computer 'actors' that could double for humans when a scene is either too dangerous to shoot, or when a fantasy effect is desired."

The current film project, which will run 90 minutes when completed in the next year or so, is excruciatingly slow, complicated and expensive. Unlike such partially computer-made features as *TRON*, which at least had a systems and software base in place, The Works barely had theory going for it at the outset.

"We started absolutely



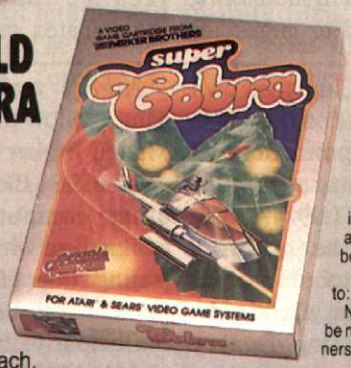
THE GAME IS NEXT TO IMPOSSIBLE. GETTING THE FLIGHT JACKET IS A LITTLE EASIER.



ENTER THE SUPER COBRA™ SWEEPSTAKES, AND YOU COULD WIN AN OFFICIAL SUPER COBRA FLIGHT JACKET.

We made Super Cobra™ very, very tough to win. But because we're nice guys, we made the Super Cobra™ Sweepstakes much easier. Every entry qualifies, and you could win one of 100 Super Cobra™ flight jackets personalized with your name. There are more than 1,000 other prizes, too, like Super Cobra™ patches and Tutankham™ home video games. Just follow the Sweepstakes rules. Compared to the Super Cobra™ game, it's a day at the beach.

Available for Atari 2600,™ Intellivision,™ Coleco Vision,™ Atari 5200™ and Atari Home Computers.™



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Enter as often as you like. No purchase required. Mail a 3 x 5 piece of paper with your name, address, zip code and the words "Super Cobra™ is next to impossible" to Super Cobra™ Sweepstakes, P.O. Box 539, Lowell, IN 46356. Entries must be received no later than Jan. 31, 1984.

Winners will be selected in random drawings from all entries received by VENTURA ASSOCIATES, INC., an independent judging organization whose decisions are final. The odds of winning are determined by the total number of entries received.

Sweepstakes open to residents of the United States. Employees and families of Parker Brothers, their advertising and production agencies and VENTURA ASSOCIATES, INC. are not eligible. Void where prohibited by law. All federal, state and local regulations apply. Winners will be asked to sign an affidavit of eligibility and their names and likenesses may be used for publicity purposes.

For a list of major prize winners, send a self-addressed, stamped envelope to: Super Cobra Sweepstakes Winners List, P.O. Box 766, Lowell, In 46356.

No duplicate winners. No substitution for prizes as offered except as may be necessary due to availability. Taxes are the responsibility of winners. Winners will be notified by mail.

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Atari 5200 graphics shown

® PARKER BROTHERS

from scratch," Williams recalled. "I wrote the screenplay, but we had to design all the programs and determine the hardware that would make the characters move and enable us to manipulate them."

In 1978, Williams wrote a screenplay for a film he called The Works, taken from the Czech word for "robot," meaning, "Labor". Along with the Lab team of a dozen graphic artists, producers, students, programmers and engineers, Williams set about translating his script into computer-generated imagery.

"We chose the science fiction genre to guide our work because it's interesting—more playful and more open to experimentation than other forms of literature. Robots, in their likeness to man (in terms of motion and form) gave us a good base from which to develop computer-animated figures," he said.

The Works' basic plot involves a "world-spanning computer complex which has been controlling earth since the last World War," according to Williams. A cast of 25 computer-generated robots includes the major enemy—a giant Ant; the hero—Panzer; and the heroine—T-Square. As enticing as the film may sound, don't expect to hear about a theatrical release date, yet.

"Works is strictly an r&d project for now," Williams said, adding, however, that portions of the film may be available for educational viewing at a later time.

The fantasy setting of The Works provides a perfect backdrop for its advanced technology, which combines several powerful software systems with extremely fast hardware to draw, color, and animate the film. The main characters, for example, were either created without any prior blueprint, or with just the artists' sketchpad renderings, using the Lab's two-dimensional TWEEN system, and/or a three-dimensional system for modeling geometric shapes. A PAINT program is used to color the figures (several graphics packages for Apple, Atari, and other popular home computers employ paint programs on a much simplified level to give owners a taste of this sophisticated technique.)

Similar to conventional animation, the first step in computer animation at NYIT begins in the artist's head. But that's where all similarity ends. Consider our enemy, the giant Ant. This character was first conceived and pencil-sketched by senior research scientist Dick Lundin. Then, working with an electronic pen, or "wand," wired to monitoring equipment and to large-scale computer storage or memory banks, Lundin drew (or traced from his prepared drawing) directly onto an electronic tablet.

While no marks appear on the tablet itself, the movement of the pen is transmitted and displayed on the video terminal so Lundin could adjust his handiwork as he went along. To create an illusion of motion, the animator drew only the extreme stages of the Ant's movement—the starting and final positions. The computer filled in all the "in-betweens." Hence, the system's name, TWEEN.

"TWEEN is essentially a blueprint for non-existent objects," explained Bill Maher, production designer. "Using this complex modeling system, we can manipulate the robots in any way imaginable."

New software now being written at the Lab will enable characters to be even more easily manipulated, giving them smooth, flowing, near-humanlike motion.

The other major modeling method, using geometric shapes, allows artists and animators to produce figures completely by computer without benefit of a photograph, drawing, or any other pre-existing graphic form. Here, geometric shapes are stored in computer memory, then recalled on-screen and manipulated much like fluid building blocks until proper form, order and distance are defined to the designer's satisfaction. Light values are then assigned to each shape to simulate advancing and receding planes, shadows, etc. The location of each shape and its light value are digitized into the computer, and the information is then translated back as a graphic image which appears on the monitor.

Thus, T-Square, our heroine, boasts a shiny metallic space suit, clear-colored but with a nice, high sheen produced with a combination of light sources and shadow code.

"After a while of using this technology, the robots seem so real," Maher observed. "You live with them day and night. They're constantly in your mind." A Lab visitor has accidentally knocked one of Williams' prized models from its file cabinet pedestal, smashing it all over the floor. Williams smiled ruefully.

"I don't know if I can get him back together," he said sadly. Then, brightening, "but that's what our work at the Lab is all about: Our computer-made robots don't break. You never have to dust them or move them around—physically, that is. Yet we can make them come to life at the touch of a key. To us, the robots *are* real."

—Suzan D. Prince

Branching Out

Now you'll be able to "play Atari today," even if you own another system. Atari has abandoned its long-standing policy of self-sufficiently producing games for only their own arcade hardware, to also market their arcade hits, most popular licensed games, and their own software for use on the Apple II and IIe, Commodore 64 and VIC-20 computers, IBM PC, and the TI 99/4A. The titles should be on store shelves by October, and include Pac-Man, Centipede, Defender, Dig Dug, Donkey Kong, Stargate and Robotron. Protector, Shamus and Picnic Paranoia will also be available for the TI 99/4A.

Atari's multi-formatted games follow the direction of Mattel, Parker Brothers, Imagic, CBS Electronics and other computer software companies, who are also releasing titles for the most popular systems around.

Obviously, this video game giant has finally decided to get in on the gold rush and will also be making software unrelated to games in multiple formats, such as educational, home management and personal development programs.

—Michael Fine

More Video TV

If all the news of industry layoffs, losses and slumps makes you envision an upcoming world without video games, that all-powerful entertainment and news medium, television is beginning to indicate, as never before, their official acceptance into the American mainstream. First there was *Starcade*, which broke new ground (*Video Games*, July and August '83) in the quiz show format. And now come two new contenders: *The Video Game Challenge (Video Games*, October '83) and *Video Game Previews*.

The later attraction is a weekly magazine-type format show, produced by ViSTAR Productions, which should give you a reason to turn on your set other than to play video games. There are reviews of computer and home game hardware and software, arcade game reviews, strategy tips, national competitions, new development reports such as closer looks at videodisc technology, on-the-spot news reports related to video games, and "top of the charts" rankings of the most popular games.

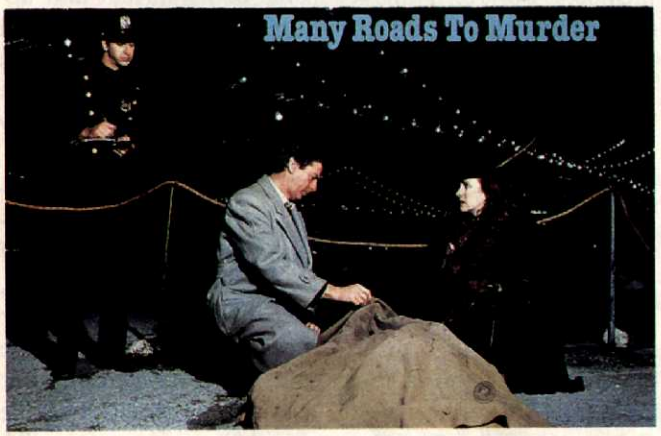
Video Game Previews will be hosted by Mark Ganzel (formerly involved with Don Kirschner's Rock Concert), Teal Roberts (who appeared in the movies *Night Shift* and *Young Doctors in Love)* and Michael Leon (of the network TV program *Renegades*).

And the omnipresent Nolan Bushnell (as in Androbot marketer, Chuck E. Cheese and video game creator) pops up here too, giving creative direction and input to the program as the Chairman of ViSTAR.

You can tune in to *Video Game Previews* around October 1st. The show will be nationally syndicated then, so check your local listings for exact time and station.

With video game programs coming into their own on American television, what can we expect in the future? We've already got Pac-Man cartoons. Perhaps a "Video Games 60 Minutes" or video game sit-coms? We'll just have to stay tuned to find out.

—Michael Fine



Foul Play

It's November, 1938—two years since the Reardon case and Stew Cavanaugh is back on the job caught up in a baffling mystery of murder and intrigue. It might be a matter of smuggling, foreign espionage, revenge or, maybe, that African expedition holds some of the secrets. After all, there are sixteen different plot lines and solutions to unravel and discover as Vidmax brings us MysteryDisc II.

A follow up to their award winning *Murder, Anyone?* interactive videodisc game (May, Video Games), Vidmax's new *Many Roads To Murder* continues to stand out as a unique form of home entertainment. With production values rivaling those of feature films, the MysteryDisc series has once again recreated the world of the old time private investigator in search of clues to solve an always complex crime.

Cavanaugh and his assistant, Maxine Blair, take you from a Harlem jazz spot to the Brooklyn Bridge and inside an exclusive explorers club to help you find the murderer, motive and method. But the process is never an easy one. Just when you think you know 'whodunit' another suspect appears to throw you off the track. And so it goes with this exciting mystery adventure for home laservision systems.

—Roger C. Sharpe

Winning Ways

Is it possible to watch TV and improve your Pac-Man score at the same time? It is if you're watching *Championship Pac-Man*. Now being seen on several Warner Amex Cable stations, this first-of-its-kind show has been developed to teach new and intricate playing techniques in order to help viewers attain higher scores. Demonstrating his winning strategies and patterns on the show is Ken French, the world's champion Pac-Man player. He earned this title with a single verified game record of just under six million points.

Mr. French has brought together and recreated some of the best patterns of play available. Featured on the show are interviews, pattern graphics, unusual tips and advanced game theory while the game is played.

The show is available on videotape cassettes which are available through ICAP, 625 Broadway, N.Y., N.Y. 10012.

—Melinda Glass

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The Sound of Music

By its own definition, The Dovetail Group, an independent designer of video and computer games, is "off the wall."

"We have to be a little zany here, or we couldn't produce to our full creative potential," explained Gerri Brioso, president of the three-year-old firm, which makes its headquarters in Brioso's New York brownstone apartment.

Dovetail specializes in the seemingly unzany areas of health, science, and especially, music learning games for children. But the way the games are presented makes an observer realize that Dovetail's appeal to youngsters is purely offbeat—and very creative. Among its titles are Soundtrack Trolley, Bug Hunt and Honey Hunt, all recently licensed by Milton Bradley for use with MB's sound synthesizer and the compatible TI 99/4A. Each game focuses on teaching an aspect of music theory for children ages four to eleven.

"The basic philosophy behind our music appreciation games is to develop the child's ear in a totally entertaining manner," Brioso explained.

Dovetail creates completely original characters for each game, gives them distinct personalities, and then features them in a continuing series. "The characters take on a recognizable appeal for the children," Brioso continued. "We try to develop each character so that a child will start looking for his favorites from program to program.

If the company's learning-to-love-learning premise sounds familiar, it's because

all four members of Dovetail made their names with The Children's Television Workshop, producers of *Sesame Street*. Brioso, a CTW graphic artist for 11 years, created all the computer graphics and artwork for CTW's Sesame Place theme parks in Langhorne, Penn. and Dallas, Texas. She also won a 1983 Emmy Award for outstanding achievement in children's programming and graphic design for her work on *Sesame Street*.

Richard and Paul Freitas are not only brothers, but also Dovetail's musical directors. Among other television accomplishments, they have composed music and lyrics for *Sesame Street* and the Children's Computer Workshop, a CTW unit. Peter Sauerbrey, the group's marketing director and writer, was a publicist for ABC television network's *World News Tonight* and *Good Morning America* before getting involved with Dovetail. Additionally, he is the author of several CCW computer games featured at the theme parks.

This strong children's television education grounding hasn't escaped Dovetail's latest client, CBS Software. That publisher recently signed the group to a contract for a new series of musical teaching packages, to be offered first for Atari, Apple and Commodore computers, then on other popular systems. The colorful games will debut at the upcoming Winter Consumer Electronics Show in Las Vegas this January and feature, among others, a lovable beatnik-looking animated band called The Jazz Scats. According to Sauerbrey, The Jazz Scats were inspired by Dovetail members' work on a tune for *Sesame Street*.

"The song, "School is Cool", dealt with these Greenwich village-type characters who tell children how great it is being in school," he recalled. "In the same way, the Jazz Scats will make kids want to snap their fingers to make music."

Actually, he added, children will do much more than snap their fingers with the new games. The Jazz Scats (who, incidentally, will also star in their own Saturday morning TV series produced by Dovetail for CBS) and other characters will lead youngsters through such musical basics as notes, rests, minors, sharps and keys as well as enable them to master more advanced material when they're ready. One game, Sauerbrey explained, is set up similar to a silent movie. "The player gets to write the plot to his own film creation, compose, and then score the music," he said. "Then he gets to rehearse his masterpiece with 'The Melody Makers,' another Dovetail band." Each successive lesson in the series becomes progressively difficult.

Other games in development for CBS Software to be released next year, the marketing director revealed, include a program that "merges football with music on the field;" The Weather Game, a "seasonal adventure" which teaches a basic awareness of differing weather patterns; Star Constellations, which teaches youngsters to identify major constellations of the sky and zodiac; and a group of health-related programs.

Besides CBS, Parker Brothers is also negotiating with Dovetail for the rights to some of its current and upcoming creations. Gerri Brioso believes her team's success is linked to its efforts to bring pleasure to ordinary learning situations.

"We want to make learning with computers as entertaining as any other aspect of a person's life—television, records, books or other media, for example," she said. "We try to bring our television experiences to the computer screen on many different levels so that the child can take the lesson at face value as pure fun, or go as in-depth as he or she wants."

Is there yet a final, underlying goal to the design team's work?

"Absolutely," the *Sesame Street* veteran explained. "We want to provide a little silliness, because comedy is a very important part of learning. Kids should be able to laugh and learn at the same time. If they don't laugh at our games, then we've blown it." —*Suzan D. Prince*

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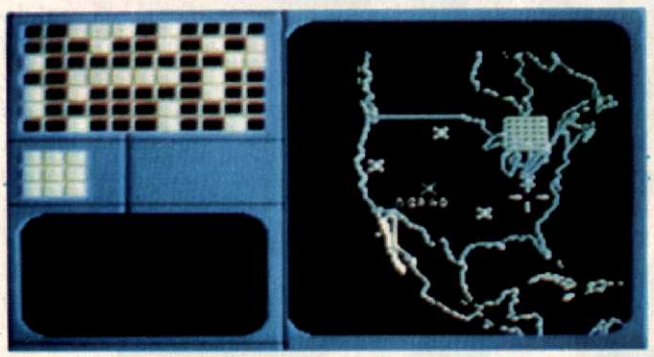
Making A Play for WarGames

If you thought Matthew Broderick had his hands full in the summer movie sensation *WarGames*, or you aren't willing to personally experience "life imitating art" for real, now you can see how you would fare in a similar situation, thanks to THORN EMI Video. THORN has recently released a home computer game called Computer War, based on the movie. Your part is to save the world from nuclear destruction after being alerted by NORAD (the North American Air Defense System) of an attack.

Computer War is compatible with the Atari 400, 800 and 1200, the Commodore VIC-20, the TI 99/4A and other home computers.

Practically the only difference between the game and the real thing is if you lose the game, you at least get another chance.

—Michael Fine



Open and Shut Cases

For those enthusiasts who just can't seem to part with their computer and/or VCS equipment, here are two answers to all your travel and storage headaches.

The TravelMaster Division of Southern Case, Inc. has introduced several new carrying cases for the Commodore computers. They are the TravelMaster TCC-2360 and the TravelMaster TCV-2360 for the Commodore 64 and VIC-20 respectively. The TCC-2360 can store and carry the Commodore 64 computer keyboard as well as a disk drive, while the TCV-2360, will tote a VIC keyboard, cassette recorder, power pac unit, four cassette cartridges and two joysticks. The exterior is made of durable polyethylene and the interior is of high density die-cut foam, thus providing a safe and easy method for taking it all away. These cases also feature luggage-style handles and locking latches. (About $79.95.)

Another storage system for home video game equipment is The Space Case, by Pusher Sales, Inc. of Chatsworth, Calif. This sleek, compact storage system is ideal for the Atari VCS, Sears Telegames Video Arcade, Mattel's Intellivision II and ColecoVision. It stores and protects up to 28 game cartridges, joystick and paddle controllers, instruction manuals, the console and all accessories and wires in one unit. Construction is of a high quality plastic which is virtually indestructible, with the Space Case providing sectioned storage compartments, a snaplock translucent dust cover, hidden carry handle and protective rubber feet. The base is slotted, which allows the game console to reman plugged in so that it can receive continuous power while in storage. (About $25.)

—Melinda Glass

Life Imitates Art

Who would have thought when *WarGames* made its debut that this movie could become reality? Well it has. In Milwaukee, ten young computer whizzes saw the movie and decided it would be fascinating to emulate the adventures of David Lightman. So, they started tapping into other computers.

They used their home computers to gain access to college files, a Los Angeles bank and, to top it all off, a computer at a nuclear-weapons laboratory in Los Alamos, N.M. Government sources claim that the lab computer, which was broken into, contained no classified information, nor could these electronic trespassers gain access to one that did.

Of course, the matter is not being treated lightly by the FBI. Criminal charges might even be brought against the computer invaders by the United States Attorney's office.

Those being investigated feel that the problem is not totally their fault. The 'project' did get out of hand, according to one of the computer whizzes, but the lack of security when it comes to computers contributed to the situation. It is just too easy for someone with a knowledge of computers to gain access to other machines. Stay tuned... *—Melinda Glass*

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The Music Man

Ed Bogas Breaks the Video Game Sound Barrier

By Mary Claire Blakeman

Ed Bogas is scoring more than points on video games. In fact, during March of this year, he became one of Atari's first musical consultants. Bogas, who has composed scores for many movies, TV shows and commercials, is now also writing music for video games.

"To my knowledge, this is the first time a professional musical composer has been brought in to score the music for video games," says Steve Wright, director of special programs in Atari's Coin-Operated division.

A San Francisco musician trained in math and computers, Bogas' entry into the video games industry was a case of the right man being in the right place at the right time. He had scored the music for many of Charles Schulz' *Peanuts* TV specials, so when Atari licensed video games based on Charlie Brown and friends, Bogas was naturally chosen to work on the project.

"It was a beautiful synthesis of art and technology to bring Ed Bogas in," Wright says. "He's a musician whose work has been nominated for the Grammy and it's almost blind luck that he also happens to be a computer freak."

Some of Bogas' credits include scores for such television shows as *Here Comes Garfield* and *Sesame Street*; feature movies, including *Fritz the Cat* and *Eddie Macon's Run*; commercials for Coca-Cola and The Gap; and album arrangements for many top recording artists, including Don McLean and Lou Rawls.

While his Hollywood credits are impressive, Bogas hardly looks the part of a hotshot movie musician. Rather, with his lanky frame and wire-rimmed glasses he reminds one more of a typical computer hacker, and his boyish grin makes him look younger than his 39 years.

But besides bringing an impressive talent to Atari's staff, the hiring of Bogas signals the growing influence of music on video games and other possible changes in the industry. Video games may begin to incorporate environmental sounds, such as the ocean or use joystick-controlled music in which the player has to figure out an auditory code to score points. Most importantly, video game production could further develop its resemblance to movie-making.

"Three years ago, game development was less sophisticated and one engineering type did everything," says Wright. "But how many engineers are good designers, good at graphics, animation, music and everything? That was phase one of game development. In phase two, we brought in graphic artists and saw a nice evolution in the visual appeal of the games. This is phase three with the music. Pretty soon, video games will be more like movie production with teams of specialists. There's no more one man, one cartridge," Wright adds. "There's just not enough talent in one man to do it all."

That opinion is shared by Ed Anderson, manager of manufacturing at Namco America, the company that brought Pac-Man to the world. "Some companies used to just throw in the music on top without much thought," Anderson says. "They would ask in-house if anyone played the piano and then they'd just drop in a few notes here and there. But consumers get wise fast and they hear so much music on radio, TV and the movies, and they can tell the difference. They want that professionalism in video games and I think we'll see more of it."

Anderson has credentials that go beyond his longtime membership in the video game business. He also plays five instruments and composes music, such as the score for the upcoming network version of the game show *Starcade* (*Video Games* July and August). In 1977, Anderson began pushing the idea of combining musical effects with video game play. And a few years later, when he worked for Exidy manufacturing, Anderson got the chance to incorporate "psychological music" into the background of the game Venture.

But Anderson's work has primarily centered on arcade games while Atari —through Bogas—is working to transfer that kind of music to home versions. "Music was very popular in coin-operated games and the only time that would work in home games is when there would also be a conversion from coin-op," says Atari's Wright. "The first home game where music mattered was Frogger. When Frogger hit, all the game magazines said how great the music was. That's when my

Illustration by Jill Bauman

eyes lit up and I thought 'Ah, ha! That would be good in other games.'"

The small memory capacity of home games has accounted for much of the limited sound on those versions as compared to the coin-operated models. "Most games are capable of producing tones and effects but they do not use voice chips," Ed Bogas says. "Generally speaking, you have unsophisticated chips to deal with and the worst case would be the very original Pong game. The Atari 2600, which has been the standard for years, had a limited two-voice capability but modern computers are getting better and better sound chips. The arcade games are the best of all because they have much fewer restrictions since they load in a whole bunch of sound chips."

Fitting his music into the nooks and crannies of a computer memory is a challenge Bogas enjoys and says, "It's like a new crossword puzzle for me." As Steve Wright explains, "The 2600 was never designed to do music—what we have here is a piano with a bunch of broken keys, so Ed has to thread his way up and down the keyboard avoiding those spots."

Because instructions for game play take priority in the computer's memory, music for games is usually done toward the end of production. Typically, Bogas will meet with a game designer and then think about appropriate sounds for the video play. "I generally think about it a day or two and if I haven't got an answer by then, something's wrong so I go back and talk to the game designer," Bogas says. Similar to other composers, Bogas can write his music without hearing it first, so when he does a game score, he types instructions for the music directly onto the computer keyboard.

"You are sending instructions to the computer," he explains. "There is a time when a game has to take its time to go back up the diagonal, to the top of the screen so it can start scanning again, and that's what's available to you to send sound information. In American television that's about one sixtieth of a second and fortunately, that's plenty of time."

While Bogas is generally successful, he says that the effectiveness of music can only be revealed once it is actually incorporated into a game. "You can think about it, but you don't really know until you put it up there and see if it works," he says. "Sometimes we'll have a big discussion and it doesn't work and we end up getting it right by accident."

Ed Bogas (above) is the first professional composer to score music for video games.

Besides technical concerns, games present another musical challenge. Game players, unlike moviegoers, will hear the music numerous times so it cannot be repetitive or boring. "If you write something for games like a jingle, it can get old because when you're playing you'll hear it 50 times and start to hate it," Bogas says. "So you have to cycle things over each other and move them around so you can have a greater variety in each game."

Joyce Hakansson, head of a computer software firm in Berkeley where Bogas also does musical consulting, agrees that game music needs unique qualities. "Something that is very cute once may get boring by the fifth time you hear it," she says, "so the sound has to be rich, but also non-intrusive."

Evoking particular human emotions will probably be the biggest job for music in video games of the future, according to Hakansson and others in the industry. "Music will be keyed to the scenario of the moment in game play," says Steve Wright. "We'll put in musical scoring so that when you're in trouble in the game, the music will set the mood for trouble. The music therefore will enhance the emotional state you're in while playing the game."

Again, this use of music is very similar to that of movie scores, and Wright reveals that in the future, full orchestras could be included in video game sounds. "In the future, we may videotape game play and take it down to a studio where an orchestra will play along with the screen," he says. "It will be a big production, just like a movie score. That's why I wanted to bring in a professional such as Ed."

But to accomplish this goal, Wright admits that Atari will have to continue its research into expanding the capabilities of computer memory for video games.

Expanding the edges of this kind of research is another good reason to have someone like Ed Bogas on board. Joyce Hakansson reports that Bogas has already developed one music editor that breaks through old styles of fitting music into computers. "He's not just producing what's already been done," she says. "He's expanding the limited musical capabilities of the games and then stretching those limits." ▲

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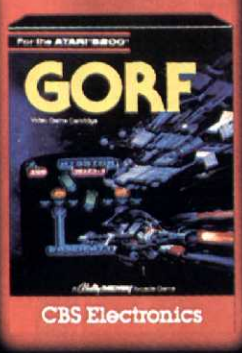

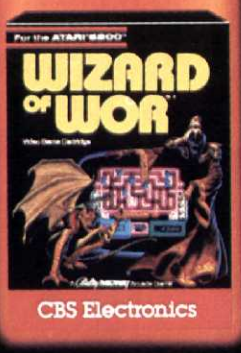

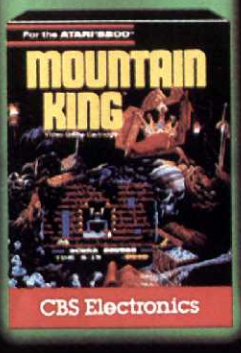

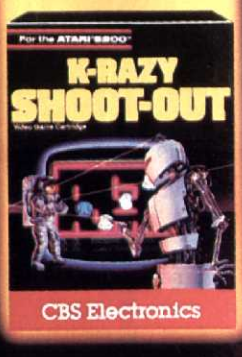

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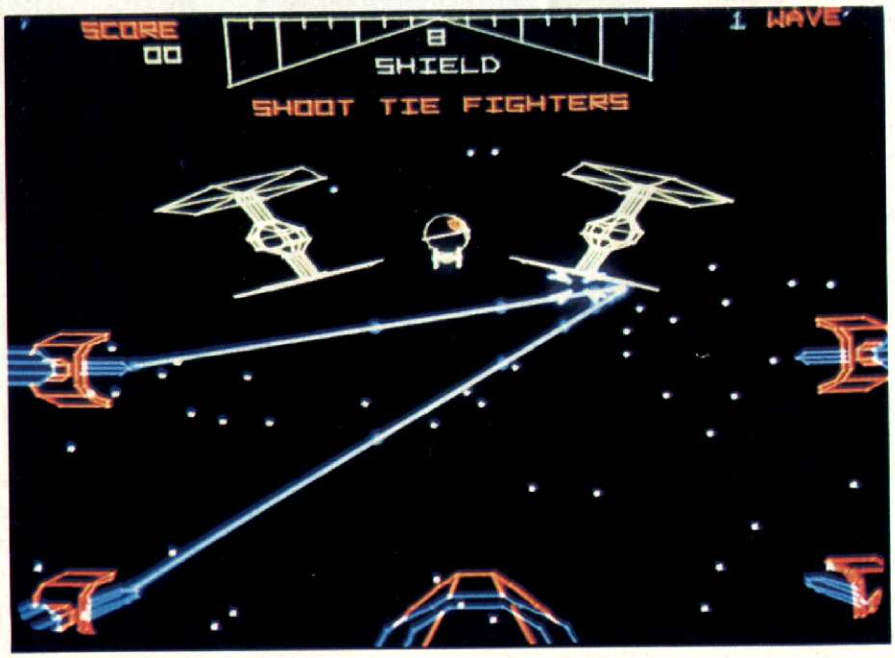
The Making of STAR WARS the Video Game

Going Behind The Scenes At Atari Coin-Op

By Jamie Williams



Coin-op games come and go with dozens introduced every year from a number of manufacturers hoping to find that special blend of graphics, sound effects, theme and play action. Sometimes the result is an effort which is quickly forgotten. However, once in a while we're fortunate enough to find a game that we'll go back to time and again.

Whatever happens, the winners and losers have one thing in common—an incredible creative process that takes a concept from some vague idea to a finished product. More often than not, when we find a game in our local arcade, months of hard work have already been expended to get it to that point. In fact, it's not as easy as many might think to design and program a video game.

In an effort to give you a better idea of what happens behind the scenes, Video Games *offers an exclusive look at the making of* Star Wars: *The coin video experience from Atari. Although this arcade hit features some innovative techniques in sound and graphics, the story of its existence is not that much different from any of the other current games available around the country. So read on and see what you think about the amazing world of coin-op video design.*

Mike Hally first saw *Star Wars*, the movie, seven years ago. "I thought it would be great," the 27-year-old recalls, "to be Luke Skywalker in my X-Wing Fighter, blowing up the Death Star." Back in those days, that was as far as Empire-toppling fantasies went.

Much has happened since. Hally, who received a B.S. in mechanical engineering at the University of Santa Clara, went to work for Atari, at first designing pinball machines. When flipper games didn't pan out for the company, Hally moved over to video, eventually becoming supervisor of the project office,

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which meant being involved in a number of games in development at any given time. One was called "Warp Speed"—a two-year-old space game research project involving development of three dimensional image capabilities.

Then word came in mid-1982 that a deal had been struck with Lucasfilm, Ltd., giving Atari's Coin Video Games Division the rights to produce games for each of the *Star Wars* movie trilogy: *Star Wars, The Empire Strikes Back,* and *Return of the Jedi.*

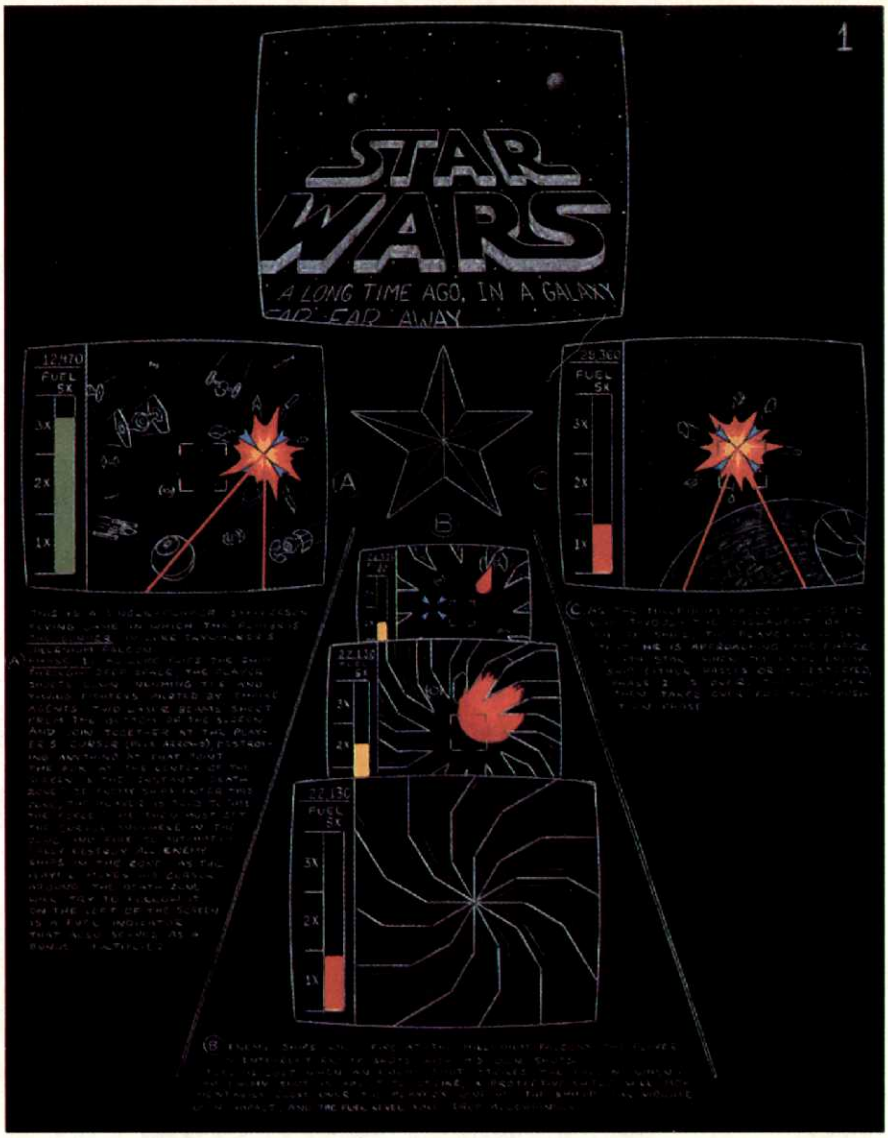
Hally immediately knew which game he wanted to work on, and Warp Speed ("the experimental hardware design made new technologies available") became Star Wars. It had the two basic elements he wanted: it was a first person perspective and it was a vector game.

"Having vector graphics enabled us to realistically provide the sensation of flying over terrain, or through the trench. Also, to my knowledge, no hardware exists that's capable of doing real three dimensional transformations except vector. When you're playing, vector graphics enable you to see through objects, and the lines aren't static. Besides," Hally adds, "the best effect for space is blackness, and black just looks better in vector."

Hally went to work designing story boards to show his ideas to a receptive and enthusiastic Lucasfilm audience. "They were excited with our ideas, but they're very protective of what they call the "Star Wars Universe," Hally explains. This means that all ideas, concepts, characters and storylines presented in the film must be preserved in any licensed products.

"For instance, in the game, Darth Vader's ship appears in the space dogfight sequence. The player can hit it and it will spin out, but Vader's ship will not explode. The reason for this is due to the fact that Vader didn't die in the first movie." Any such inconsistencies in the storyboards were quickly pointed out to Hally and corrected.

In the meantime, a project team was being formed. Greg Rivera, a 30-year-old senior microprogrammer, whose previous game credits included Four Player Football and Warlords, was working on Warp Speed. Suddenly he found himself programming Star Wars. A graduate of the University of



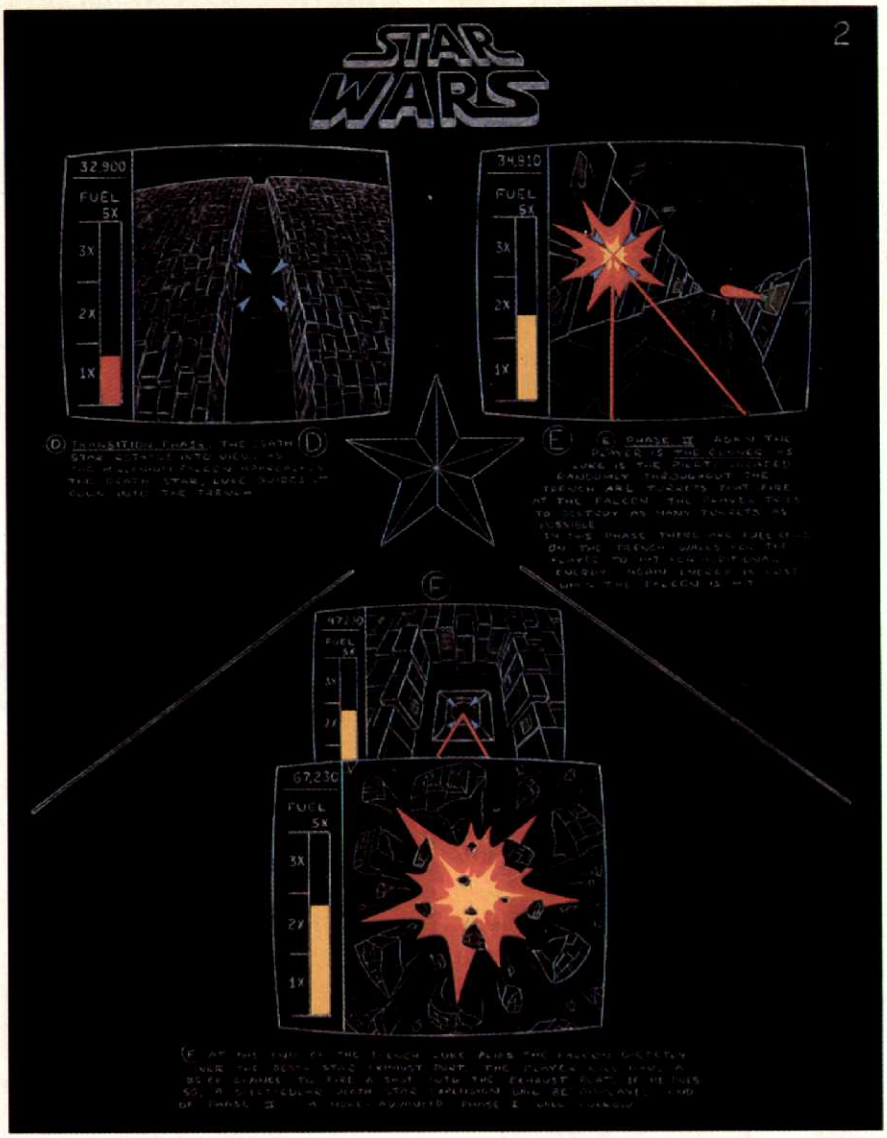
Original storyboards presented to Lucasfilm Ltd. for approval.

Redlands with a B.S. in mathematics, Rivera had worked as a systems analyst for four years before joining Atari in 1978. Jed Margolin, a staff electrical engineer, who designed the hardware for Warp Speed, also stayed with the project after it changed. Graduating from the University of Michigan with a B.S. in electrical engineering, Margolin impressively owns two patents for methods of generating objects on a screen. Along with Hally, they went to work formulating the space sequence for the game.

According to Hally, one of the biggest headaches came right away. "When you design a game, one of the most important elements is giving the player total control over his actions. But in space, there are no boundaries. Suppose a player didn't want to zoom down to the Death Star at all, but wanted to fly around aimlessly across the universe for hours? Some controls had to be defined, and we were stuck for an acceptable way to do it."

The answer, according to Rivera, was so easy, the team kicked itself for its long hours of frustration. "We decided to put the X-Wing under the control of R2-D2 during the space sequence. In the movie, he was in the X-Wing with Luke, and that way, in the game it was up to the droid to find the Tie Fighters and determine when the attack on the Death Star should begin."

The original storyboard contained only two game sequences: the dogfight and the trench fight. Then, Rivera recalls, the game design labs were visited by movie producer Steven Spielberg, who was shown the Star Wars game in



development. "He looked at what we had completed and suggested it might be fun to have a sequence where the X-Wing flies over the surface of the Death Star." The result was the birth of the middle, laser tower sequence.

It was decided that the team needed some additional help, and in January of 1983, 27-year-old Norm Avellar, another senior programmer, and Eric Durfey, a 26-year-old technician, were brought in from other projects to work on Star Wars full time. Avellar, who received degrees in both electrical engineering and computer science from U.C. Davis, describes the work he first did on Star Wars as "the more mundane tasks—high score routines, non-volatile memory routines, the self test mode"—while Rivera focused on the game design itself.

Durfey had come to Atari from Trias Corporation, a Silicon Valley electronics manufacturing firm. His responsibilities were to provide technical backup and support for the programmers, debugging hardware designs and implementing hardware changes and modifications to fit the program changes.

Rounding out the team was 27-year-old Earl Vickers, who had recently joined Atari. Previously at Midway Manufacturing as video game designer, Vickers had worked on game sound for TRON and Kickman. "When I first came to Atari, I didn't want to work on a game right away. Instead I wanted to develop a system for improved sound capabilities. Then, I saw the graphics for Star Wars and said, 'Okay, I'll do it.'"

A decision had been made to lift voices right off the Star Wars soundtrack and digitize them for playback after certain cues in the game. Luckily, Margolin had been given the job of figuring out what kind of speech synthesizing system would work best in arcade games just before the project.

"If all we did was a straight digitization of speech, then for the amount of speech we used in Star Wars, we would have needed a printed circuit board measuring 11½" x 19" just to store it! The speech integrated circuit we used is 1/28th in size and basically one memory chip which together replaced that entire board."

Hally and Vickers pored over the movie script, looking for appropriate pieces of dialogue to use in the game. They indicated their choices to Lucasfilm, who then lifted those pieces off the soundtrack and sent them to the labs for digitization.

Other sounds weren't as easy. "We had to come up with a sound for the spaceships when they fly by the player's X-Wing," Vickers says. "I read about different sources used by the sound effects people in the movie, and found out that the screaming noise was originally an elephant trumpeting. So, I went out and bought a sound effects record, ran the elephant sounds through high pass filters, digitized them, and it worked."

The musical themes presented another challenge. Vickers wonders what composer John Williams would think of his adaptations. "I'd be curious to know. I hope I didn't mangle it too badly. There are things you can do with a full orchestra that you just can't do with four channel square waves."

The work hours were getting long as the group prepared for the first marketing test, known as a focus group, in January of 1983. At that point, only the space sequence programming had been completed, and the controls consisted of a joystick and a fire button.

"When we took it out to focus group that first time," Avellar recalls, "the players really disliked the controls, which could be changed from normal joystick to pilot controls, essentially reversing everything, at the flip of a switch. Those with piloting skills became confused with the joystick on normal setting, and everyone else was confused with pilot setting."

Soon after that, the joystick was removed and the flight controller, which

The Star Wars project team (pictured left to right): Norm Avellar, Mike Hally, Earl Vickers, Greg Rivera, Erik Durfey, Jed Margolin.

At right, ¼-inch scale model of game cabinet design.

had become developed for another project, was added. The difference in the game play was remarkable. Everything seemed to be meshing together.

At the time of the focus group, the laser tower and trench sequences were largely undeveloped, and Rivera and Avellar were moving full speed ahead on the programming. Now finished with the "mundane" tasks, Avellar was assisting with game design, focusing on special effects, including the brilliant Death Star explosion.

As the project date of testing in the field came closer, the hours grew longer and longer. Rivera says it was not uncommon to find the team members at work seven days a week, 16 hours or more a day. "Norm and I brought in sleeping bags and worked straight through more than a few times. I for one got very tired of eating at fast food restaurants."

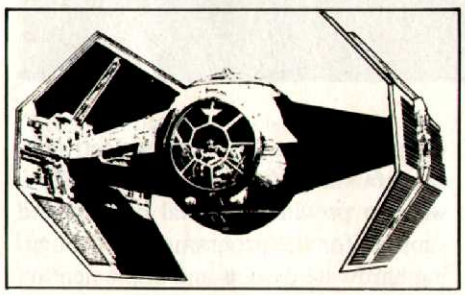
Hally's wife, Julie, was expecting their first child and the team made attempts at naming the baby. "If it was a boy, they wanted us to name it Han or Luke," Hally smiles, "and if it was a girl, it was supposed to be Princess Leia."

Durfey remembers that period of game development as one filled with doubts. "I looked at all the elements of the game and said to myself, 'there's nothing there.' I didn't really believe in the game until it came right down to the wire."

Vickers agrees. "I was afraid the game didn't have any strategy. Then, the last few weeks, everything sort of came together and I had to stand back and say, 'Wow—this game is really something.' "

Hally nods when he hears this. "It really didn't look like it had much promise, as far as game play, until the last minute." He smiles self-confidently. "I knew it was there all along . . . I just had to keep the team, management and everyone else believing it."

Irritations and personality clashes would seem to be inevitable among a group who have spent over one hundred exhausing hours a week trying to meet deadline pressures. Surprisingly enough, the team has only praise for the other members. "Sure, there were tensions," Hally admits, "but the team members all had the same goal in mind—to build a great game. And everyone loved what he was doing. When there were problems, we sat down and worked them out. There wasn't time for hassles, and everyone knew it."



Line drawing for cabinet art of Darth Vader's ship.

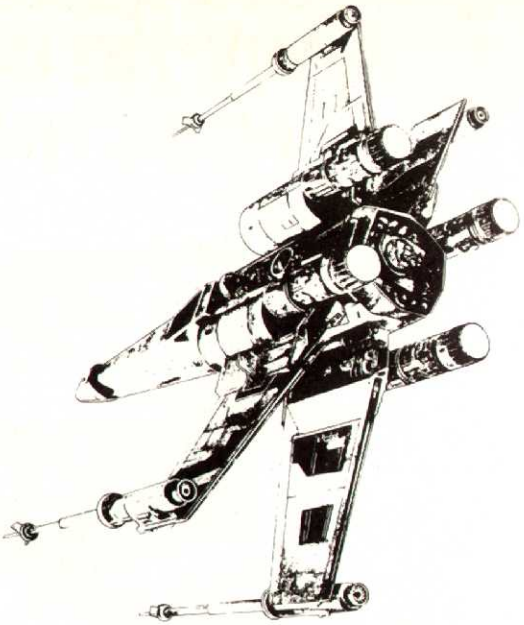
The date for the field test was postponed as the team added, dropped or changed elements of the design. Lucasfilm made periodic checks on game progress and design. "There are other things we would all like to have seen in the game," Hally says, "but we simply ran out of time. Every new element you add to the game play means a new element to graphics, hardware adaptions, time to program. And all those things take time we just didn't have. But, at the same time, if you waited and waited to put everything you wanted into a game, you'd never get it out for the player. You'd have a technical wonder that just sits in the lab."

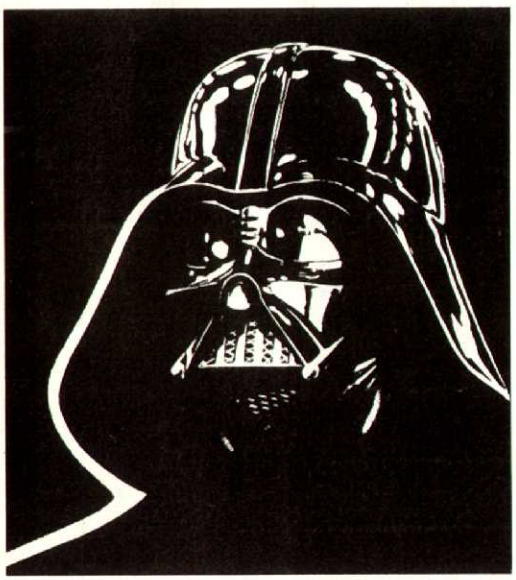
On Saturday, April 30, the cabinet was done, the program was in final form and the game was finally ready to go out on test. With the exception of the Spielberg-inspired laser tower sequence, it was amazingly similar to the original storyboard concept.

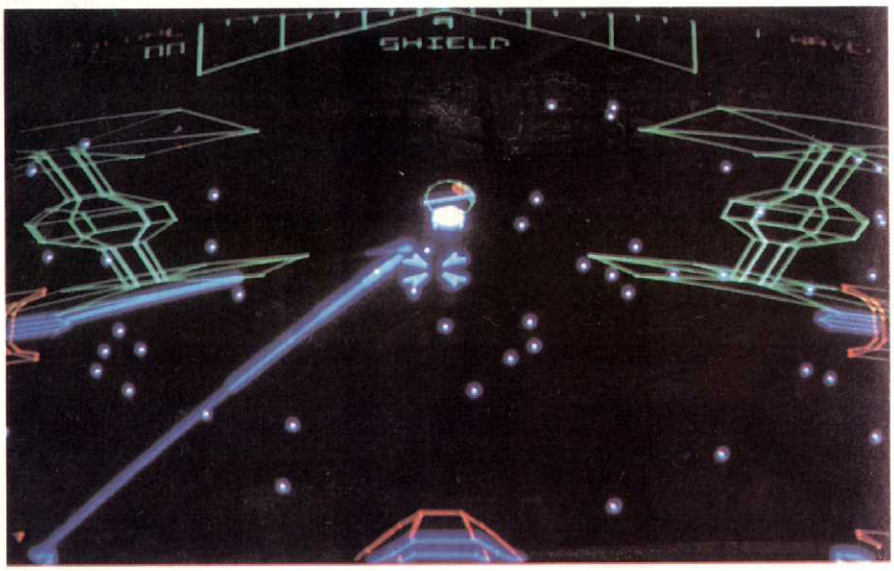
Avellar recalls that the entire team loaded it onto a truck and drove it to its Northern California test location. Once at the arcade, they set it up and stood by for about an hour, watching the reactions to it. He smiles as he remembers. "When we saw the players with it . . . that was when we knew we really had something special." ▲

Editor's Note: On May 18, 1983, Mike and Julie Hally became the parents of a baby girl. They named her Andrea.

Star Wars cockpit model draws SRO crowds.

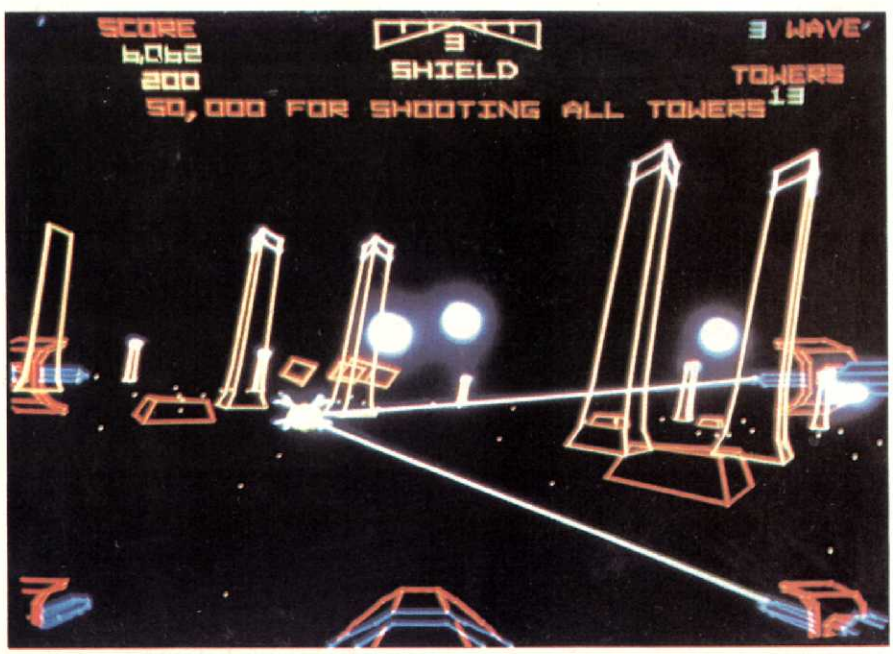


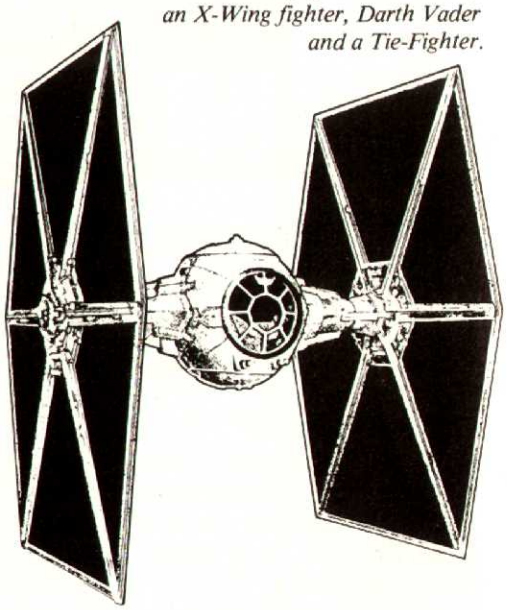




First screen dogfight action in space.

Line drawings for cabinet art of an X-Wing fighter, Darth Vader and a Tie-Fighter.





Second screen maneuvering around towers and bunkers on the Death Star surface.

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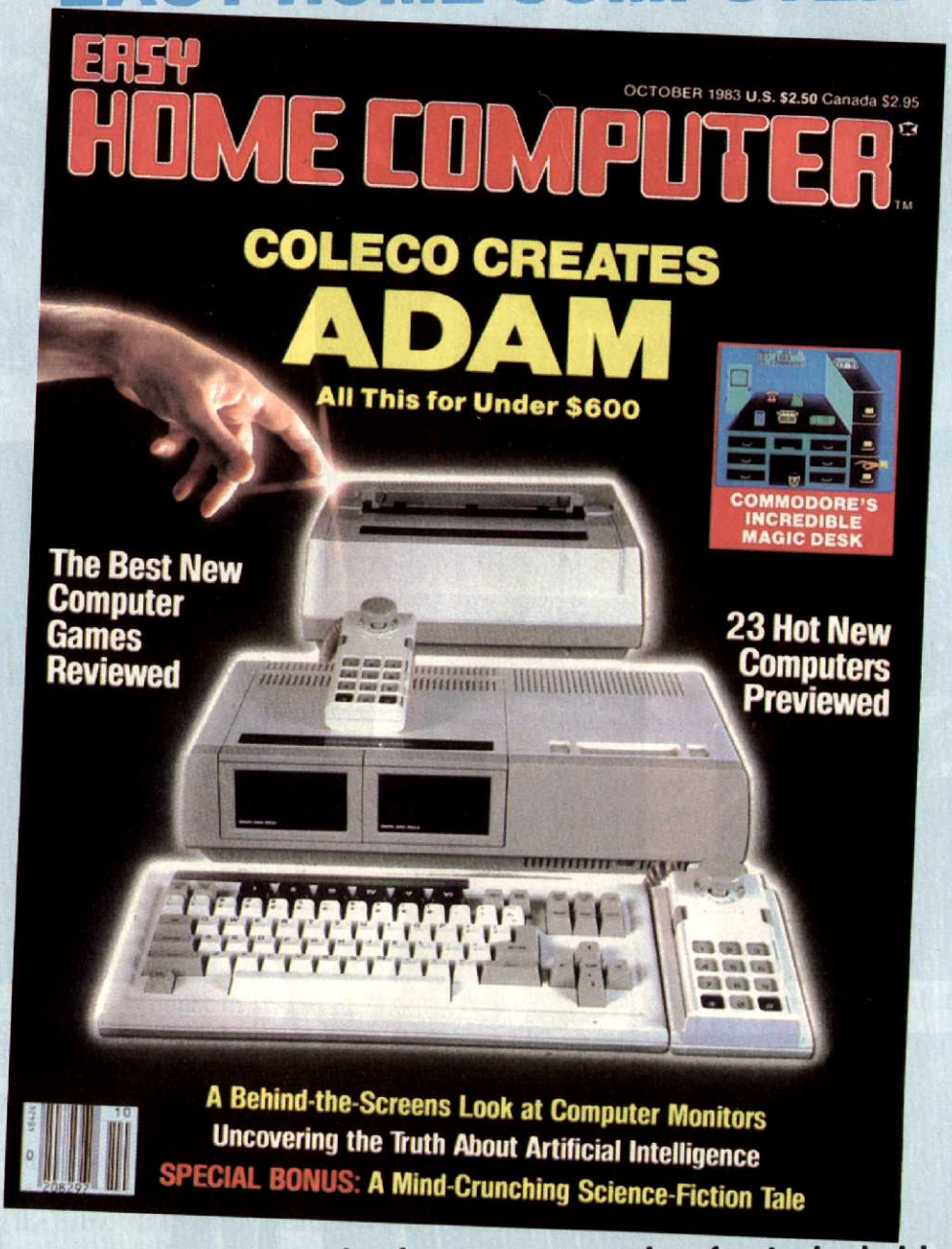

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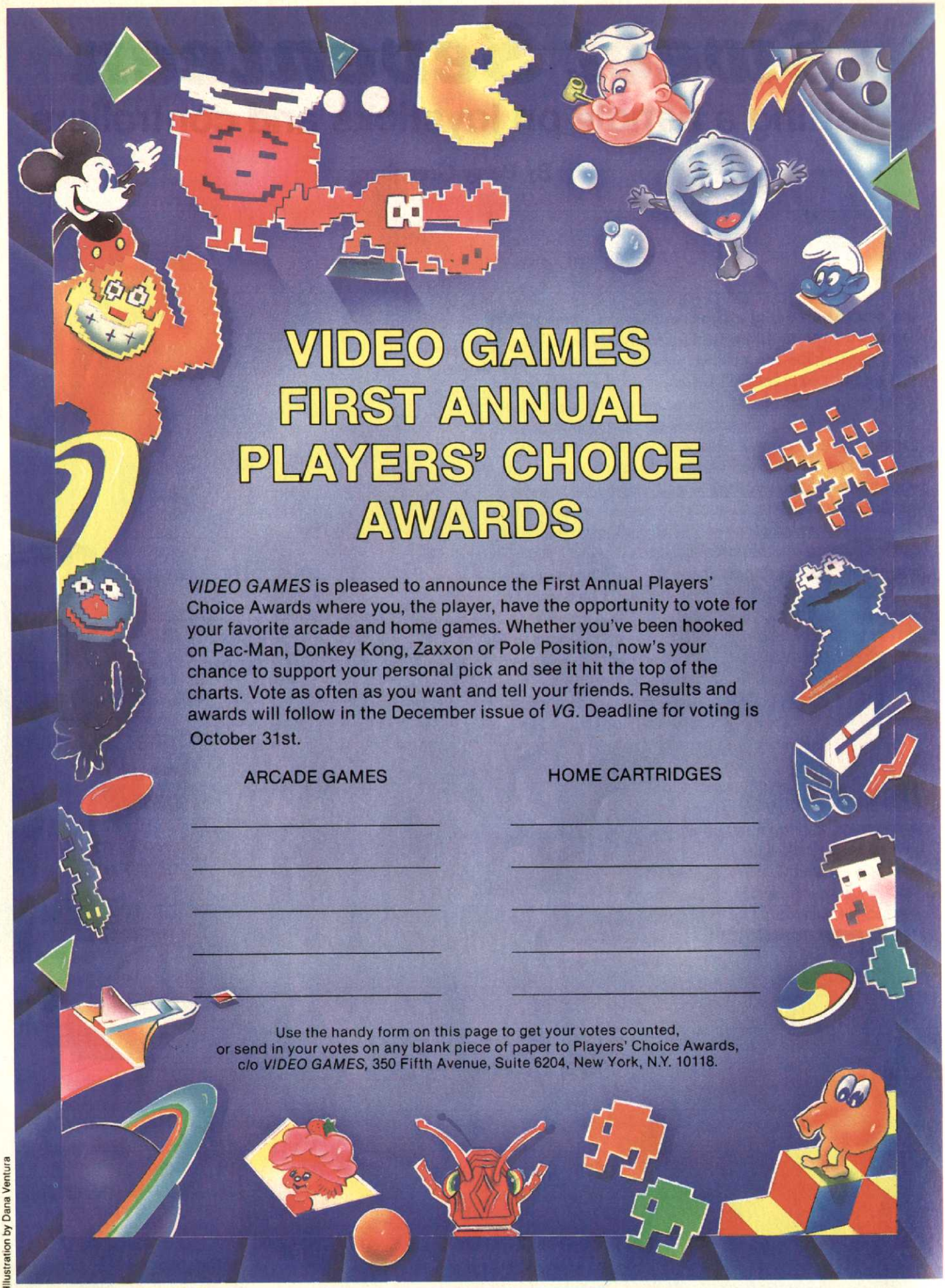

VIDEO GAMES FIRST ANNUAL PLAYERS' CHOICE AWARDS

VIDEO GAMES is pleased to announce the First Annual Players' Choice Awards where you, the player, have the opportunity to vote for your favorite arcade and home games. Whether you've been hooked on Pac-Man, Donkey Kong, Zaxxon or Pole Position, now's your chance to support your personal pick and see it hit the top of the charts. Vote as often as you want and tell your friends. Results and awards will follow in the December issue of *VG*. Deadline for voting is October 31st.

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Use the handy form on this page to get your votes counted, or send in your votes on any blank piece of paper to Players' Choice Awards, c/o *VIDEO GAMES*, 350 Fifth Avenue, Suite 6204, New York, N.Y. 10118.

Illustration by Dana Ventura

Sweet Seventeen

Getting a handle on joysticks and controllers

By Perry Greenberg

Despite the recent calamities in the video game and home computer industries with most of the major manufacturers experiencing incredible losses, the replacement joystick business still seems to be booming. It's as if the auto industry were suffering, but sales of fancy steering wheels were on the increase.

However, although all cars have adequate steering wheels, the same can't be said regarding the joysticks and controllers which are included with individual game or computer systems. In fact, the standard models are woefully inadequate to suit the needs of serious players.

Atari's original stick, for example, was uncomfortable, imprecise and fragile. It would be surprising if anyone who has owned a VCS for an appreciable length of time, hasn't already worn out the original sticks. Add to this the fact that the demand for personal computers continues to grow, but that many models don't include joysticks as part of the total package, and it's easier to understand why replacement controllers have become so important.

At this point in time, choosing the controller that's right for your needs isn't a simple matter. There are any number of considerations to keep in mind and the glut of available models doesn't help. Admittedly, the entire process is very subjective in terms of evaluating your options. Some people may prefer a stick that's easy to hold with a light touch. Others may be more comfortable with a heavier stick that's anchored to an immovable surface providing stiffer and more precise movements.

To judge the performance of individual sticks, I though it best to test them on games which exemplify the major genres available. Ms. Pac-Man seemed to be the logical choice for tight maze games, while Berzerk appeared to be ideal as a looser maze-and-shoot game. Star Voyager was selected for first

Illustration by Ron Walotsky
Photos by Perry Greenberg

person space shoot 'em ups and, for jumping, Donkey Kong. When it came to vertically scrolling battles, we chose Zaxxon and River Raid. Finally, Q*bert proved to be the best effort of a maze and jump game and ultimately became the acid test for sticks, since it requires constant diagonal movement, which seems to be the most difficult direction to go.

Although the most important factor in the attainment of high scores is the expertise of the player, the precision of the joystick plays a very important role and there are, indeed, marked differences between scores obtained with different sticks. Some sticks are valuable assets and a joy to use by affording the player with accurate eye-hand movement where mistakes are the fault of the person. Other sticks are frustratingly imprecise causing the serious player the agonizing experience of losing a life despite no error in judgement or quickness of hand.

The most popular and best selling joystick at present is Discwasher's **Pointmaster Pro** ($27.95) and for good reason. It is an excellent stick. Having

Pointmaster Pro and Quickstick

favorably reviewed its predecessor, Pointmaster 1 (April *Video Games*), it was great to see the sensible improvements incorporated into this version which makes a very good stick even better.

The design of the stick is essentially the same except it now comes equipped with suction cups on the base (allowing for anchoring and one-handed use) and a rapid fire button for continuous shooting. The long, tapered and very comfortable handle, with a thumb controlled fire bar on top has been retained. What can best be said about this stick is that you move where you want to and when you want to. It has a smooth even throw and was very responsive in all types of games. I especially liked it for flying games like Star Voyager and scrolling action games like Zaxxon and River Raid.

Unfortunately, I can't say the same about its sister stick, The **Quick Stick**. At first glance it appeared to be the answer to those atrocious thumb disks on Intellivision. These snap on joysticks have an even springy feel and are the only "stick-on" joysticks we tested for Intellivision which actually make those controllers feel like good, conventional joysticks. The only problem is that these add-ons have the lifespan of some recently discovered atomic particles. There are two in a pack, which means that you might be able to get through one game before you have to buy more. The construction leaves much to be desired. It's comprised of two pieces of plastic held together with a small brass screw. Had the designers at Discwasher made the shaft of the screw slightly longer, it would have added the needed support to strengthen the shaft and make this stick hold together under stress. Unfortunately the screw is too short and ends at the delicate part of the apparatus where the two pieces join. This union is short lived for after a few quick thrusts the stick is in two pieces, with the threads of the shaft stripped. Unless there's a design change soon, buying these sticks, which sell for $9.95, would constitute the fastest ten dollars you'll ever lose outside of a Three Card Monte Game.

An excellent choice, at a very attractive price, is Wico's "**The Boss**" ($19.95). Although considerably less expensive than the company's Command Control sticks, it supplies players with

Wico's Boss

the same responsive movement. The comfortable finger contour handle is a joy to grip and all that is lacking is the option of two fire buttons as there are in more costlier models. Here the one thumb controlled fire button is located on the top of the handle which is more than sufficient. In fact, I find this design far more comfortable and prefer it to base located fire buttons. The stick works well with games in all categories, especially flying games since its design is similar to the Pointmaster.

When I questioned Gordan Gorenson, President of Wico, regarding why the company hasn't included a suction grip for its sticks, he replied that surveys show most players still prefer to hold the base with their left hands and that suction grips don't hold fast for very long. I tend to agree with him. Either way, both The Pointmaster and The Boss are excellent choices.

Another very good model is TG's **Enjoystick**. Super light and compact, the design incorporates a reversible fire but-

TG's Enjoystick

ton for right or left handed players. The small, slightly elongated hexagon shape fits comfortably in the palm of a hand, providing good movement for a wide variety of game play. It's terrific for maze games such as Ms. Pac-Man where precision movement around corners is important. Also, the light touch of the stick cuts down on muscle soreness and should improve scores markedly since there's very little effort involved in moving the handle. In fact, it's the easiest moving stick I've ever encountered.

The short stick allows for either a two fingered pinch grip where movement is wrist controlled or via a thumb push. Either way the TG is an excellent choice. However, it does take some adjustment to adapt yourself to flying games and extended one-way travel. But, as was the case with the other two highly recommended models it worked very well with Q*bert, negotiating this difficult maze which requires constant diagonal movement. The only misgivings I have about this stick is the steep price of $34.95.

The **Zircon Z-Stick** ($19.95) is the new and improved version of the company's Video Command Stick reviewed in

March *VG*. These designs approach the concept of joystick controllers from a radically different approach. Instead of a long handle coming out of a flat base, we have a knob jutting out of a tube. You grasp the tube with one hand, while you control the knob that moves the figures on the screen with the other. This is the only stick that's truly designed to be used comfortably with two hands and for that

Zircon's Z-Stick

Zircon should be praised. However, there are other problems which become apparent once you begin playing. Since this is really a stick within a stick, the inner stick, which is what you're really moving, tends to have a very loose feel to it. You never really know in what direction your screen figure will move. I understand that the Z-Stick was modeled after the actual joysticks found in fighter planes such as General Dynamic's awesome F-16, so it's not surprising that scrolling games, including River Raid, Zaxxon and Star Voyager perform well. However, the loose control is excruciating with a tight maze game like Ms. Pac-Man.

I was told that when the stick is available nationally, it will have a brace to restrict movement for four-way operation when used to play maze games.

This deluxe version of the Zircon Video Command Stick does sport some nifty features. There's a rapid fire switch for continuous shooting and a second button that automatically slows down your craft when depressed.

The **Pro Stick II** ($24.95) from Newport Controls, is for the Atari VCS and all other compatible systems. The stick features a large base which must be held with your palm against the contoured sides so that your thumb can rest against the top of the base while your index finger is positioned on the fire button. There are fire buttons on both ends for right and left handed players.

The Pro Stick III ($29.95) has a Tri-Fire bar which allows for the two button fire control necessary on some Coleco Games. The right and left sides of the bar correspond to the left and right buttons of the ColecoVision stick. When you press the center of the bar it corresponds to pressing both buttons simultaneously. This steel-shafted stick comes equipped with a knob at the base that changes the stick from four way to eight way control, giving you better response for Pac-Man type maze games.

The stick has a small round knob with a very short throw and feels like an improved version of G.A.M.E.S.' Super Joystick reviewed in March *Video Games*. It feels sturdy and the contoured base can be comfortably held, however, I'm not sold on the short, stiff movement of the stick. I much prefer the easy sliding movement found in arcade sticks which have been so well emulated by Wico, D Zyne and TG. The stick worked fine with Ms. Pac-Man when I set it on four way control. Although I didn't miss a turn, I found the stiff movement, coupled with the small, hard black ball, to be uncomfortable over the long run. Despite its specific eight way setting for games which demand diagonal movement, the Pro Stick was extremely unresponsive when tested on Q*bert, to the extent that it was almost useless and

Pro Stick II and III

made the game a frustratingly boring exercise.

The stick worked well with such flight games as Star Voyager, Zaxxon and Cosmic Avenger, the latter needing the two button operation. However, it was far less comfortable than the "grip" handles of the Boss and the Pointmaster Pro. Also its tight action couldn't compare with the smooth precision movement of the other sticks. The advantages of the Pro-Stick III are its rugged construction and its ability to work with the ColecoVision system. In fact, there's even a "Y" cord built into the plug so you can attach both the ColecoVision standard stick with its keypad and the Pro Stick into the same port. Unfortunately, on the whole, it's a decent stick but doesn't compare to some of the lower priced competitors.

The Kraft **Switchhitter** ($19.95) doesn't look and feel like much. It's made of light, hard plastic with a square, uncomfortably held base. If it's true that you can't judge a book by its cover, the

Kraft's Switchhitter

same homily may not apply to joysticks, since this model plays the way it looks. The stiff, short handle doesn't feel very good nor the movement. It does feature two fire buttons situated on the top left and right side of the handle which have sharp edges.

One of my least favorite controllers, it didn't work well with any of the various game categories and was simply impossible with my ultimate joystick tester Q*bert.

Suncom **Joysensor** Joystick Simulator ($34.95) claims to approach the concept of game controllers in a revolutionary way. Instead of having to move a joystick in multiple directions, you're given a touch sensitive pad. The pad has directional demarcations that let you know in what direction your cursor will move based on the position of your thumb. The attractively packaged device also has some interesting options which include a maze game diagonal lockout for Pac-Man-like challenges where

diagonal movement works to your detriment. It also has a fire pad that allows for right and left handed control and, if touched in the center, allows for continuous rapid fire.

This chrome plated wallet sized controller gets high marks for aesthetics (it's truly a gorgeous device) and comfort, since its shape fits neatly in the palm of your hand. The problem with this controller is that, in essence, what it's doing is transferring the movement of your cursor from the wrist to your thumb as the disc found in the Intellivision system's do. I for one have never been a devotee of thumb discs over joysticks, although this device is far superior to the disc controllers of Intellivision.

If you can't get enough of controllers that employ your thumb, this may be the one you've been looking for. The Joysensor does work well with most games, but it takes some getting used to for good control with scrolling action games. When it comes to tight maze games such as Ms. Pac-Man, the lockout option is a noticeable improvement. Surprisingly, this model even passed our Q*bert test to an acceptable degree. In fact I found the stick more responsive when set on four way movement than eight. The touch sensitive pad is far more responsive than the Intellivision discs and requires a very light touch. But the bottom line with the Joysensor is that it's still a thumb controller and I much prefer the wrist movement offered by conventional joysticks. But those of you out there who want to save your wrist, might just give this controller a thumbs up sign.

Suncom's Joysensor

The rationale behind the existence of the **Gemini Gemstick** totally escapes me. It looks, plays and feels exactly like the standard Atari stick. Admittedly there are some very minor cosmetic differences such as a yellow fire button rather than red. The model has Gemstick printed on it, and there are directional demarcations around the shaft. But otherwise it's identical in look and feel to the standard Atari stick.

Gemini's Gemstick

This might be a good marketing ploy if the Atari stick was the best around, but it's not as the replacement manufacturers would attest to. In some respects, however, this may be the quintessential replacement stick because it replaces the standard stick to a tee without improving it one bit. And, at a suggested retail price of only $7.99, it may well be a good bargain basement choice for the "budget minded" player.

The **Super Champ Joystick** from Championship Electronics ($16.95) is an attractive model with some nice amenities. It features a long, very comfortable tapered handle with two fire buttons; one on top for thumb firing and one right below for index finger fire control. The stick also has a retractable wind-up 10-foot cord and suction cups for one hand control. Despite its somewhat uniquely handsome facade, there's a feeling of deja vu about the stick. Because when you get right down to it, the design is nothing more than a conventional, standard Atari joystick all gussied up like something far more exotic. It's almost like buying a car that looks like a Ferrari to find out that it has a VW chassis and engine. The long handle does make this stick far more comfortable than the Atari version, with the configuration allowing for less effort needed to move. The suction cups, intended for one-handed control, are totally inadequate. They're too small and flimsy to properly hold the stick to any surface.

In the final analysis, The Super Champ Joystick does make it a suitable replacement for scrolling games such as Zaxxon, River Raid and Star Voyager. It's far less responsive, however, for maze games and made playing Ms. Pac-Man and Q*bert a torturous affair. The long handle and conveniently located fire buttons do work well with a Berzerk-type loose maze and shoot game. Championship Electronics has also introduced a remote control model of this stick for a whopping $69.95.

Amiga's **Power Stick** ($11) features an almost lilliputian design which may not be for everyone. Its minute size would fit in the palm of an infant. In fact, this may be the ideal stick for young children. However, for someone like myself who is approaching middle age at supersonic speed, I didn't find the stick particularly comfortable to hold and I have very small hands. The stick itself plays adequately, but the short, stiff plastic shaft is difficult to hold since you must use a two fingered pinch grip, which can cause some strain if you're playing for a while. The Power Stick does feature two fire buttons for right and left handed use but, curiously, because of the tiny size, I found myself inadvertently firing the wrong button when I gripped the stick in my left hand. With games where fire power is limited this can be costly.

The game play on tight maze games such as Ms. Pac-Man was acceptable. I did miss turns once in a while, but on the whole the stick was responsive enough for getting a decent score. On scrolling games I found the short shaft, with the necessary pinch grip, uncomfortable. Unfortunately, the Power Stick also fared poorly on what I considered the

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It is now history that, on June 15 1983, Spectravideo, Inc. joined with most of Japan's largest electronics firms to launch MSX: The most far-reaching personal computer standard in history. MSX is the name given to a specific hardware/software configuration that makes product interchangeability possible. While Spectravideo is proud to participate in MSX, we are even prouder of this fact: It was our own SV-318 computer that was used as a prototype for the MSX design! There are two important aspects to this.

First, all future MSX hardware–i.e. computers, peripherals, appliances–will be based on several key design elements of the SV-318. What does this mean to you, the consumer? A great deal, because when you buy an SV-318, you will not only be able to use all of Spectravideo's own software and hardware–you'll also be able to take advantage of all the remarkable new equipment that will be coming from other MSX participants.

In addition, the software aspect of MSX was largely inspired by the software built into the SV-318. From the outset, Spectravideo offered built-in Microsoft BASIC as its resident interpreter. Now, Microsoft also makes a LOGO program compatible with the SV-318. It was Spectravideo's Microsoft BASIC/LOGO that helped to make MSX possible.

Another standard that Spectravideo can take credit for is the built-in Joystick/Cursor Control. Built right into the SV console, this control is always at fingertips and is much easier and faster to use than external joysticks or conventional editing controls. Certain engineering elements that helped to make this built-in control possible have also been incorporated into MSX.

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While these are the computer standardizations that Spectravideo helped to initiate, they by no means represent the whole SV-318 story. This remarkable computer has also established many standards of excellence that other personal computers now aspire to:

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Champion Electronic's Super Champ Joysticks

Amiga's Power Stick and Joyboard

acid test: Q*bert. I could move well towards the right, but when I had to move diagonally downward to the left, the stick was very unresponsive, and Coily had a field day getting our tube snouted hero. I did, however, like the switch-like fire buttons which have an easy sliding movement and are very accessible. But that short plastic shaft was tough on my thumb and forefinger.

The **Joyboard** by Amiga ($39.95) is one of those inventions that seem to make so much sense when you first think about it. Then you get a chance to try out the finished product and the reaction is less than satisfying. The idea behind this device is to more realistically simulate video sports such as skiing by having a controller which requires the same motion you'd employ on the slopes. The truth is that it's really impossible to genuinely recreate the technique of real skiing on the floor of your living room. I'm a good intermediate skier and the sport requires you to master a complex set of movements, where positioning and moving your weight around in a controlled rhythm is vital.

The Joyboard, which comes with a ski cartridge appropriately titled Mogul Mania, merely requires that you alternately lean from one side to the other. Try this on the slopes and you won't get very far. Ironically, I did find this controller amusing when playing a maze game such as Ms. Pac-Man. It's fun, for a change, to actually use your legs when being chased, even if you're leaning rather than running. And even if it doesn't mimic the actual physical technique required for real skiing, the Joyboard comes a great deal closer to actual shusshing down the slopes than the wrist action of a joystick. Another ideal game for this controller might be Amiga's soon-to-be-released Surf's Up.

Another stick that fared as poorly was **Questar's Pro** design. At first it looks to be the answer to the serious game player's desire for an arcade-type stick. However the illusion is quickly shattered. The configuration provides the player with a stick imbedded in a large base that allows for one-handed arcade control. The buttons which are the only redeeming feature of this stick are clones of those found on most arcade consoles. But this similarity doesn't offset the inherent problems of the Questar controller. Although it worked well enough with flight games where the movement is broad and slow, on maze games the action of this stick was horrendous. Ms. Pac-Man seemed to have a mind of her own and Q*bert was an exercise in futility. Given these findings, it's absurd to believe that the investment is worthwhile for either the VCS model ($44.95) or the one for Coleco ($49.95).

The Atari 5200 **Trakball** ($80) is finally here and it's well worth the wait. Those of you familiar with track-ball controllers will find no surprises. This model operates the way you'd expect it to. It's very responsive and makes games such as Missile Command and Centipede play pretty much the way they do in the arcades. The player is provided with a more precise, quicker, and far more comfortable means of controlling a cursor.

I would have liked it if Atari had taken a cue from Questar and made the fire buttons on the trakball look and feel like arcade buttons. However, as with their joysticks for the 5200, the fire buttons are small, sticky, rectangular shaped. They're not as bad as those spongy little oppressors found on the joysticks, but are a far cry from those comfortable, aesthetically pleasing buttons arcade veterans have come to know and love.

Unlike other trakballs that supply the player with just the ball and fire button, this Atari version is a complete controller. It features ball, buttons, numerical keypad, as well as start, pause and reset buttons. Add to this an attractive wedge shaped design similar to the system it's matched with and it's easy to see that 5200 owners will soon be on a roll. ▲

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A Comprehensive Guide to All You'll Ever Need to Know About Personal Computers

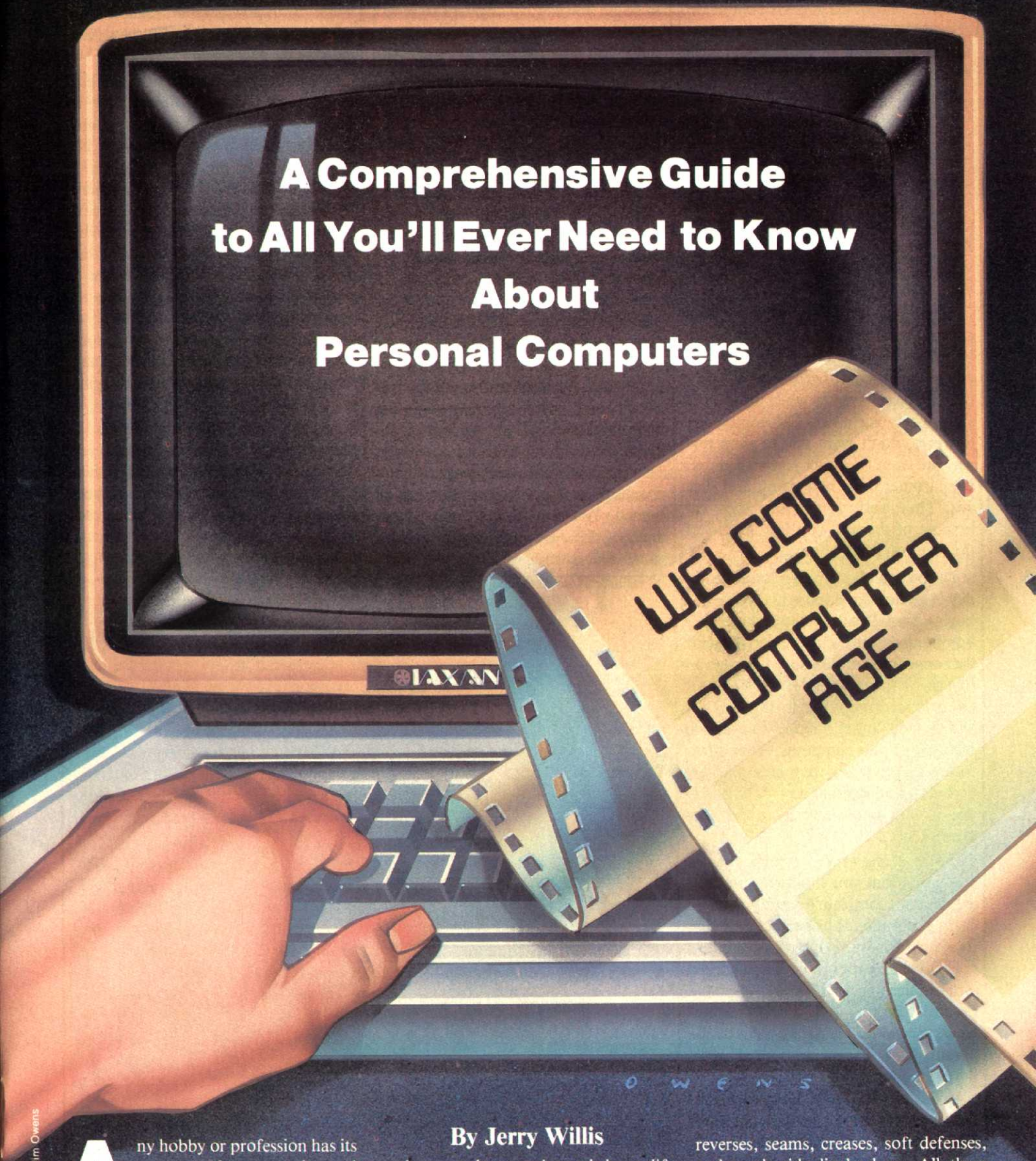

Illustration by Jim Owens

By Jerry Willis

Any hobby or profession has its own set of terms, rules and conventions. Golfers must learn about putters, drivers, bogeys and such. Tennis players learn that words such as set, love, and match have different meanings on the court than they do elsewhere, and football fans talk endlessly about goal line stands, fullback reverses, seams, creases, soft defenses, and weak side linebackers. All these terms have special meanings and are important if you're to really understand what's happening on the playing field.

Most of us have at least a passing acquaintance with the jargon of one or two sports. We have also become accustomed to jargon in more commercial areas. When shopping for a car, for example, terms like automatic transmission, five speed synchromesh, front disc brakes, quad stereo, and the like are very important. If you understand the terms above and others like them it's easier to shop for a car. You understand how cars can differ from each other, and you know what questions to ask, as well as what the answers the salespeople give you mean.

Since cars have been an important part of most of our lives from childhood, we've picked up some terminology in the process of growing up. Often this can be referred to when we want to shop wisely for a car. Car companies, however, don't want you to shop that way but want to attract you with glittering chrome, shiny new paint, and slick ads. They want you to buy their car because of the way you feel instead of the way you think about it.

Unfortunately, buying a computer today is getting to be more and more like buying a car. Prospective purchasers are bombarded with slick advertisements that appeal to emotions. A full page ad may strive to create an image, a feeling, about a particular model without really telling you much about the actual features of the computer. That often means the buyer is at the mercy of advertisements and salespeople—who sometimes don't know any more than the buyer.

Don't get me wrong, though. I'm not suggesting that you eliminate emotions and feelings completely when you buy a car or a computer. Looking for a car that feels right for you is just as legitimate a goal as looking for one with a five speed synchromesh transmission. A buyer shouldn't be forced into using feelings alone, however, just because he or she doesn't have a great amount of computer experience.

In this article, *Video Games* will take the cover off some popular computers and do a little comparison shopping. In the process you will learn a little jargon and more than a little about features to look for in a computer. You won't be a computer programmer or an electrical engineer after reading this article, but that's not the purpose. You don't have to be an automotive engineer to pick a car that's best for you. The goal is to show you what to look for when you begin shopping for a computer that's right for your needs and fits your budget.

The Essential Functions of a Computer

Before talking about the elements of a computer, it might be good to define just what a computer is. What does it do? How does it differ from other devices such as video games?

First, a computer is an electronic device that can perform many different jobs. All you have to do is give it a different set of instructions (i.e. program) and it changes from playing video games to balancing your checkbook. If you can't program the device yourself, it isn't a computer. That means a video game player is not a computer because its programs are all canned. You may be able to buy hundreds of different programs for a video game (i.e. cartridges), but you can't develop your own program and tell the game to follow the instructions you created. That's the difference between a video game player and a computer.

A true computer doesn't do any particular task. It does, however, have the ability to follow instructions (programs) given it by you or someone else. It is a programmable electronic device. I realize that definition means a microwave oven is a computer since it can be programmed to cook the Thanksgiving turkey or heat up leftovers for a late night snack. The microwave has a dedicated computer that controls its operation. What we are talking about here, however, are general purpose computers which have four main elements:

Input—There must be some method for you to input instructions and data to it. A keyboard is the most common method. Most video games, however, don't play well on a keyboard. For them you need to be able to input your responses through a joystick, game controller, or trackball.

Processing—The heart of any per-

VIC-20 computer with cassette recorders.

sonal computer is a small integrated circuit called a microprocessor. It determines how fast the computer works as well as how the computer actually performs its work. There are several popular microprocessors available today and some are better for particular applications than others. In addition, some computers give their microprocessor help by adding special integrated circuits that help create color graphics or sound.

Output—There must be some way for the computer to communicate with you. A video display is the most common method. Printers are also required for some applications and a growing number of computers will also talk to you, so you can hear what the computer is communicating as well as see it on the video screen.

Storage—Finally, a computer must have some way of storing data and programs. Generally a computer follows instructions stored in its electronic memory. As it executes instructions, however, data is generated which must be used later. For example, when you lose one of your ships in a space battle the computer must store the number of ships left somewhere in its memory. Temporary memory is called RAM or random access memory.

Permanent memory, that which cannot be changed, is called ROM or read only memory. A game cartridge is really no more than ROM in which the instructions the computer needs to play the game have been stored.

There is also a third type of storage called mass storage. If you learn to program your computer, for example, you will want to make a copy of a program so you can put it back in the computer's memory anytime you want the computer to follow that set of instructions. You therefore need a mass storage device—a way of creating a permanent copy of your program. Today there are two major methods of mass storage for personal computers — cassette and disk drive. Cassette storage involves recording the program on a regular audio cassette. Later you can tell the computer to load that program back into the computer. The Atari and VIC-20 computers have a very good cassette storage system for them. You can, in fact, buy hundreds of programs for these two computers on cassette. You buy the cassette with the program you want recorded on it and load that program into your computer anytime you want to run it.

The second method of obtaining mass storage is disk drives. A disk drive lets you record your program on disks—thin platters of magnetized plastic enclosed in a protective envelope. They look a lot like 45 RPM records. Disk drives are expensive but work much better and faster than cassettes.

The brief introduction to computers provided above sets the stage for some comparison shopping. Remember that computers really have only four major functions — input, processing, output, and storage — and all personal computers have a way of accomplishing each of these four functions. They do not, however, do it the same way. Some computers, for example, use a color display for output; others use a black-and-white display. Those with color displays are clearly better for video games than models with black-and-white output. You will see that different computers have different patterns of strengths and weaknesses. The ability to evaluate a computer's methods of accomplishing each of the four functions will be a great help when you're looking for a computer that best suits your particular needs.

Some Comparison Shopping

The Microprocessor

The technical details on an automobile's engine aren't usually that interesting or informative to a consumer. They may hasten the heartbeat of an automotive engineer or excite the mechanic at the Ford dealer, but for most of us the technical details aren't informative.

That doesn't mean, however, we don't worry about the type of engine in our car. Technical details may be uninformative, but performance details aren't. The type of engine the car has, for example, influences the gas mileage, performance, and power of the car. We want to know performance details, which is what we'll concentrate on in this article.

The microprocessor chip used in a computer helps determine at least three things—the speed of operation, amount of memory the computer can easily use, and, to a lesser extent, the amount of software available for the computer.

The IBM-PC.

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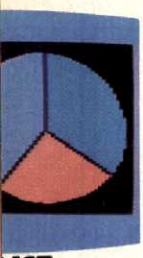

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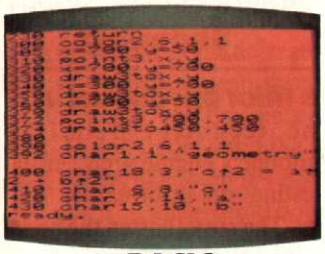

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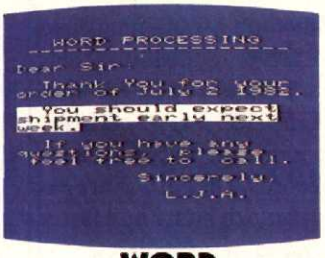

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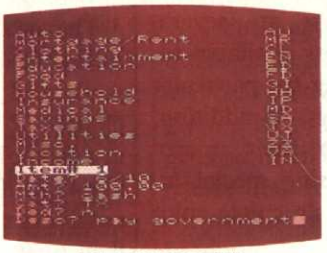

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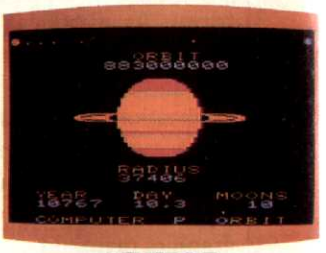

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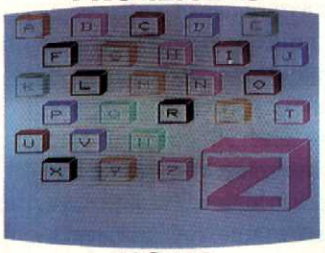

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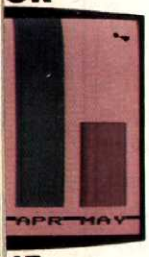

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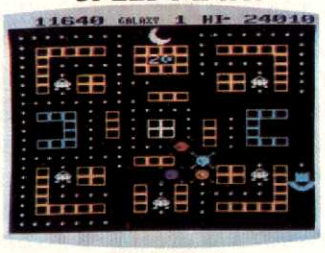

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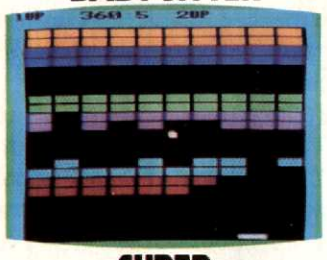
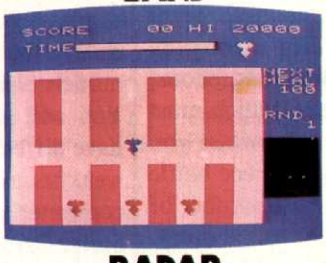
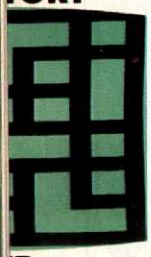


SUPER SMASH



RADAR RAT RACE

JUPITER LANDER



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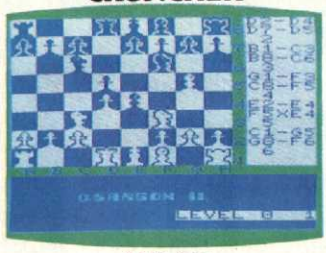

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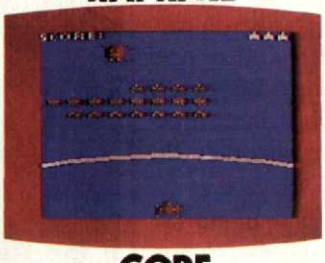

GORF

OMEGA RACE

What those extra few dollars get you is a simple little device called a Commodore VICMODEM.

It connects your telephone to your VIC 20™ or Commodore 64™ computer (resulting in something aptly called telecomputing), giving you access to information such as you see on the screens to your right.

Normally, you'd have to type a short program into your computer to help it make the final transition into a telecomputer.

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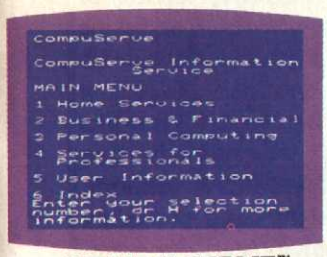

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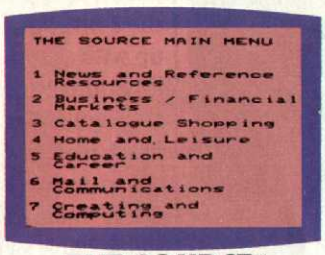

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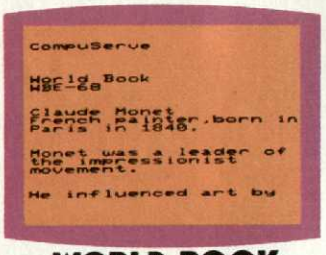

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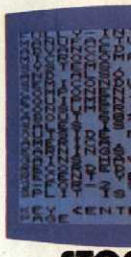

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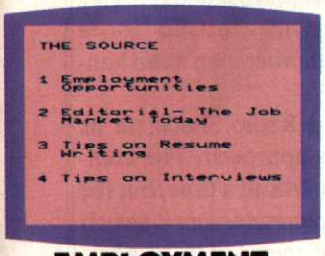

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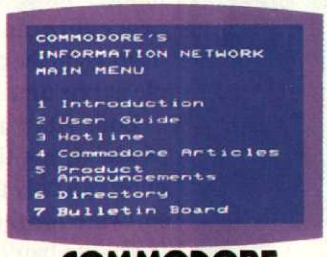

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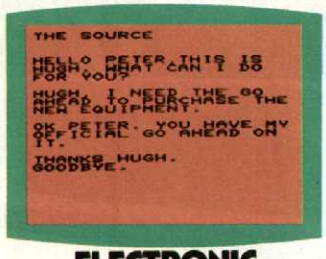

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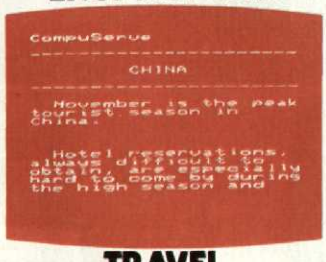

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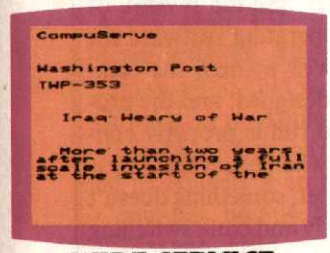

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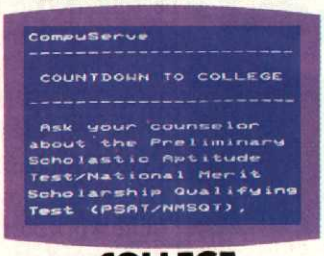

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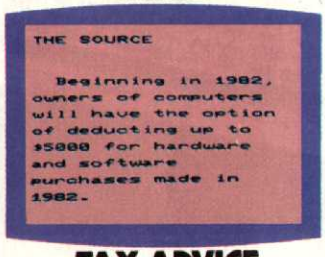

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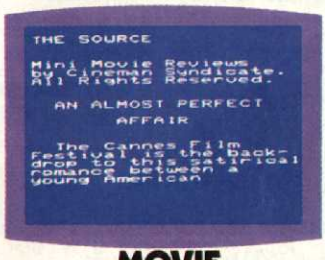

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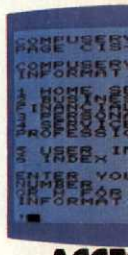

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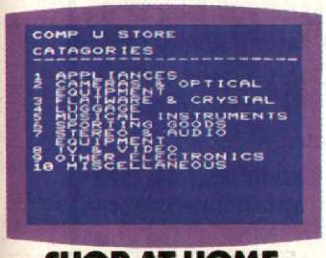

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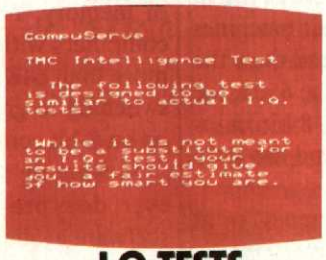

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can answer any questions you might have about your computer, or programming, or anything else Commodore-related, via electronic mail.

The Commodore Information Network is also your direct line to the Commodore Bulletin Board, which Commodore owners use to keep in touch with each other, for programming tips, Public Domain Software, and technical support.

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These are just a few examples from our existing library of software available for the VIC 20.
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The Eagle 1600 series computer.

There are actually two major families of microprocessor chips in general use today. Computers such as the Apple IIe, VIC-20, Commodore 64, the Radio Shack Model 4, and the Atari series all use 8-bit microprocessors. Newer computers, including the IBM PC and the Eagle 1600 use 16-bit processors. There are important differences between 8-bit processors such as the 6502 used in Apple and VIC, and the Z80 used in the Radio Shack. Most of those differences, however, are of interest primarily to professional programmers. The performance differences, the ones that make a big difference to consumers, show up when you move from a computer with an 8-bit microprocessor to a 16-bit chip.

An 8-bit chip is slower than a 16-bit chip in most instances. Even the slowest computers, however, are fast enough to keep up with you when running routine programs. The difference shows, though, when you ask the program to do something like displaying animated color graphics in a video game, calculate many formulas in an electronic spreadsheet, or rearrange large blocks of text in a word processor. The 16-bit machines have a larger reserve of speed than the 8-bit machines. Chips like the 6502, the Z80, and the 6800 are all 8-bit chips while the Z800, the 8088, and the 8086 are essentially 16-bit chips.

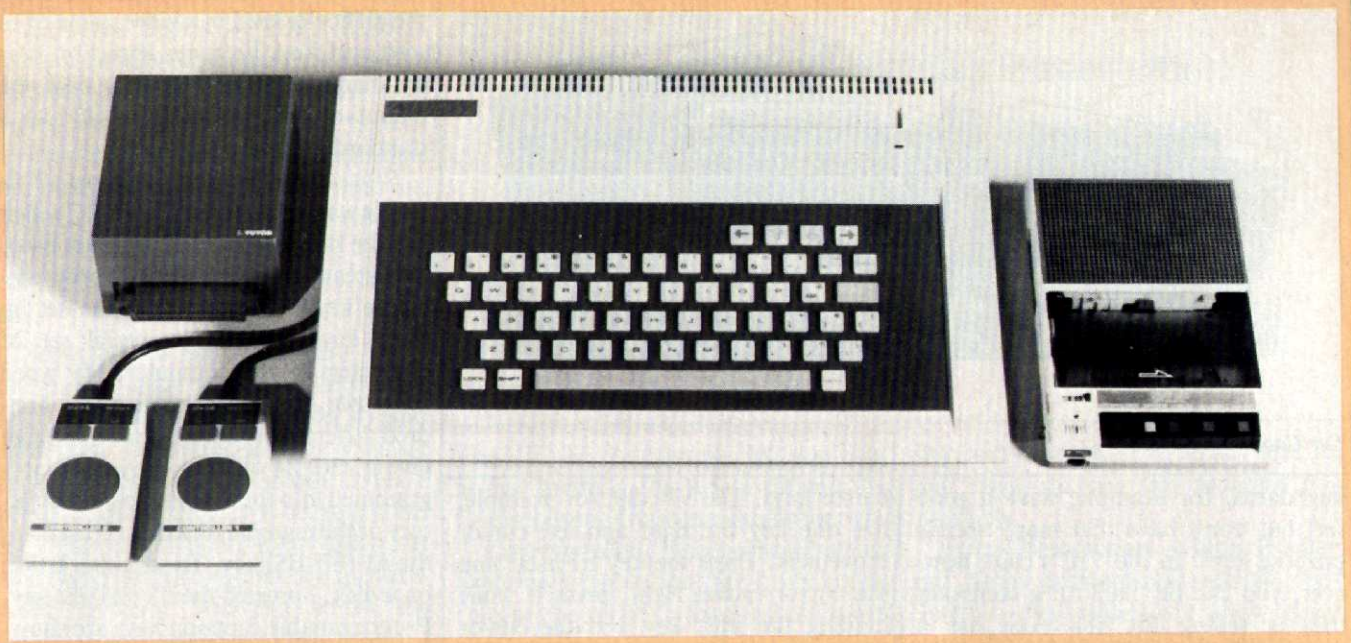
The chip used also determines, or at least influences, how much memory the computer can use. All the 8-bit chips mentioned above were designed at a time when computer memory was much more expensive than it is now. Many people thought giving the computer the ability to use just over 64,000 characters of memory (64K) was quite a feat since that much memory could cost well over $1000. Today you can buy that much memory for less than $50, however, and people sometimes want much more. Word processing and electronic spreadsheet programs such as VisiCalc, for example, work much better on machines that have a great deal of memory. A standard 8-bit chip was designed for no more than 64K of memory while most 16-bit chips can handle 512K or more. A few even let you use over a million characters of memory!

Several manufacturers recognized the problem of limited memory capacity in the 8-bit computers, however, and came up with alternative ways of dealing with it. Commodore, in its Model 64, uses a redesigned 8-bit chip, the 6510. It works much like the 6502, but was modified so it can use more than 64K of memory. Other manufacturers use a procedure called bank switching. Atari, for example, uses bank switching to give its new models more memory capacity. This procedure involves putting more memory in the computer than it can handle at one time.

Both Atari and Radio Shack, in its Model 4, use this approach. The computer can only use 64K at a time, but the software for the computer lets it switch from one bank of memory to another. You can use the A bank of 64K now, and a split second later, use the B bank of memory. If the operating software for the computer is well written, the computer is properly designed, and the program you want to run is properly configured for bank switching, everything is fine. Often, however, something doesn't quite work correctly and bank switching turns out to be more trouble than it's worth. If you really need a large amount of memory, I suggest you look at the computers with a natural ability to use more than 64K. Don't depend on bank switching to give you access to 500 + K on an 8-bit computer.

Moving up to a 16-bit system, however, does present another problem—software availability. Most of the great video games were written for computers with 8-bit processors. In fact, most of them were written for computers with the 6502 processor in it. The reason you

Maxell mini-floppy disk pack.



The new Tomy Tutor computer.

often find a program available for the Apple, Atari, VIC, and Model 64 computers is simple. All of them use the 6502 chip or a chip that is compatible with it. Converting an Apple video game to the VIC or Atari is much easier than it would be to convert it to the TRS-80 Color Computer, because that machine uses a different chip, the 6809E from Motorola. Changing chips can have a major impact on the type of software you can get for a computer. The 6502 family has more recreational software for it, but the Z80 has more business and professional software.

Input Options

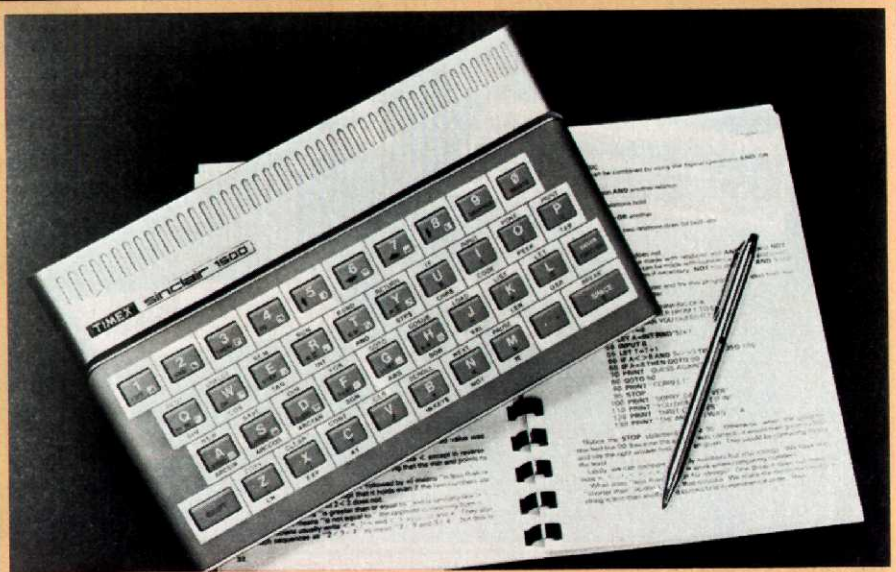
There are at least six major ways of inputting information into the computer. Keyboards are the most commonly used input method and you will find an amazing rage of keyboard formats and types on current models. Here is a sampling:

Plastic Membrane Keyboards—The Timex/Sinclair 1000 has this type. It's made of a thin sheet of plastic with letters and numbers embossed on it. Costing very little to manufacture, it is, however, very difficult to use. If you're into low cost computing, you may have to settle for one of these keyboards but don't expect to be able to do tasks such as word processing on a membrane keyboard.

Rubber Baby Buggy Bumper Keyboards—The next least expensive method of manufacturing a keyboard is to use little Chiclet style keys. Most feature little rubber or plastic squares for the keys. The Timex/Sinclair 1500, the Tomy Tutor, Radio Shack Color Computer, the Texas Instruments CC-40, and the JR-200 from Panasonic all use this approach. These are easier to use than the plastic membrane type. They're fine, in fact, for hunt and peck typists, but people who touch-type will still complain because they don't have the feel of a typewriter.

Almost Typewriter Style Keyboards—A few models have keyboards that look similar to the ones on a regular typewriter, but they aren't. The Texas Instruments 99/4A is a good case in point. It looks like a regular keyboard but is really a very frustrating keyboard to use. Some standard typewriter symbols such as the quotation mark, for example, are hard to type on it.

Typewriter Style Keyboards—Computers such as the Radio Shack Model 4, the Apple IIe, the Franklin 1000, VIC-20, and Commodore 64 all have keyboards that look and feel like standard typewriter keyboards. If you will type a great deal on your computer, and can touch-type, I suggest you look carefully at keyboards in this category. There are, however, differences in the quality, feel, and utility of typewriter style keyboards. The VIC and Apple IIe



Timex/Sinclair 1500 computer.

The Commodore 64.

keyboards, for example, have a good feel but don't have that many special purpose keys. In the VIC's case, however, you can be thankful a computer that is selling for $88 even has a typewriter style keyboard. Here are a few features to look for in a typewriter style keyboard:

Cursor Control Keys—Computer users move the screen cursor all the time, and you want a keyboard that lets you do that conveniently. A good one will have a separate cursor control keypad, often on the right side, and arranged in a cross pattern so you can press the cursor key on the right to get the cursor to move right and so on. Less satisfactory are cursor control keys arranged in a row across the top of the keyboard or two cursor keys. The VIC-20, for example, has one key for right and left cursor movement. Press the key by itself and the cursor moves right, press it while holding the shift key and the cursor moves left. Four separate keys are much better.

Numeric Keypad—If you plan to use the computer for business or professional applications, it will be much easier if the keyboard has a separate numeric keypad laid out like a 10-key adding machine. You can use the numbers across the top of the keyboard, but it isn't as convenient.

Function Keys—The Atari computer has a set of four special function keys on the right side of the keyboard. Programmers often use those keys to let you select the difficulty level in a video game or to start and stop the game. Function keys are handy and don't really cost the manufacturer that much to add to a standard keyboard.

Programmable Function Keys—This article was written on an Eagle PC which has the best keyboard I have ever used. One great feature is a set of 24 programmable keys. Each program can set up these keys to send a special set of characters to the computer. My word processor, for example, has over a hundred different codes and directions I can give it, but 24 of them have been programmed into these keys. To get a directory of the material on a disk, I just press the F1 (FILES) key. To save this article on a disk, I pressed the F3 (SAVE) key. Programmable function keys are showing up on more and more machines, particularly the Japanese imports, and computers compatible with the IBM PC.

Indicator Lights—One problem, however, with the IBM keyboard is the lack of indicators that tell you a particular feature has been activated. For example, you can press a key to tell the keyboard to type in all caps and there is no way of determining that by looking at the keyboard. If the shift lock key stays down, or a light comes on, you don't have to wonder what features are activated and which ones aren't.

The Texas Instruments 99/4A computer system.

Keyboard Layout—I don't mean to pick on the IBM keyboard, but it also illustrates another problem. That keyboard put the shift and return keys in awkward locations. The keyboard thus has plenty of keys but is difficult to use because of the layout. With these points in mind, look for a keyboard that is comfortable and convenient for you to use.

Separate versus Attached—Some computers have attached keyboards (e.g. the Radio Shack Model 4) and some have keyboards that are separate from the video display and disk drives. I prefer the detachable type because it lets me adjust the keyboard to my tastes and still keep the video monitor in a convenient location. You can adjust the system to you instead of having to adjust you to the system.

Other Input Options

Joysticks—If you plan on playing video games, joystick or game paddle inputs are a necessity. One connector is required, two or more would be better.

The Atari Trak-Ball and Touch Tablet.

The VIC-20, for example, lets you plug in one joystick; the Apple IIe and the Commodore 64 have provisions for two.

Cartridge Slot—Strictly speaking this is not an input option, but it fits in this category because it is a way of telling the computer what you want it to do. Some computers require programs to be loaded in from cassette or disk. Cassettes are notoriously unreliable and take too much time while disk drives are expensive. The easiest, most convenient method of getting a program into the computer is a cartridge. Even though they cost more, they're sturdy and let you begin running the program immediately.

Speech Recognition—Milton Bradley and Texas Instruments recently concluded a deal which will allow video game players to speak instructions instead of typing them on a keyboard or moving a joystick. Milton Bradley will supply Texas Instruments with a special hardware package that includes a microphone headset and a space age styled game controller. With these accessories you can play a number of video

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Milton Bradley's MBX expansion system for the TI 99/4A.

games and tell the computer what you want to do next by speaking some of the commands. Speech recognition technology is likely to be incorporated in many computer systems in the future.

Graphics Tablets—Several companies, including Radio Shack, Apple, and Atari, have special input devices that let you draw on a special tablet and recreate the pattern drawn on the screen of the computer. If you're into color graphics, a computer with one of these lets you do some very fancy drawing without the necessity of learning complicated computer programming procedures.

Music Input—Most of the popular home computers have programs that turn the keyboard into a music input system. There are, however, several music keyboards that let you input music instructions in much the same way you would play an electronic organ or piano. Several for the Apple computer cost between $1000 and $3000. Commodore, however, has announced a keyboard for the Model 64 that is rumored to cost less than $100.

Output Options

Let's look now at the ways a computer can communicate with you. First and foremost on the list is the video display. Every popular home computer today uses either a television or a video monitor to display information. A television is the most popular approach because it's readily available and less expensive than a monitor. Monitors, however, give a sharper, more attractive and easier to read display.

Inexpensive computers don't come with a display. You have to provide that yourself. Most do, however, come with an RF modulator that lets you plug the computer into an ordinary television. Some are only available with provisions for connecting the computer to a video monitor. Several, such as the Atari, VIC, and Commodore 64, have all the connections you need to do either.

There are many different styles of computer video displays. The Timex Sinclair 1000, for example, is black and white only. All the letters are capitals, and the graphics are crude but usable. By contrast, the IBM PC can generate upper and lower case letters as well as brilliant and detailed color graphics. The most important features of video displays are listed and described below.

Capacity—The VIC computer has a video display capacity of 23 lines of 22 characters. You can't really see that much on a screen with so little capacity. Program lines like this, for example:

```
20 PRINT "SELECT ONE OF THE
          FOLLOWING"
30 PRINT "PRESS THE LETTER
          BESIDE YOUR
          CHOICE"
```

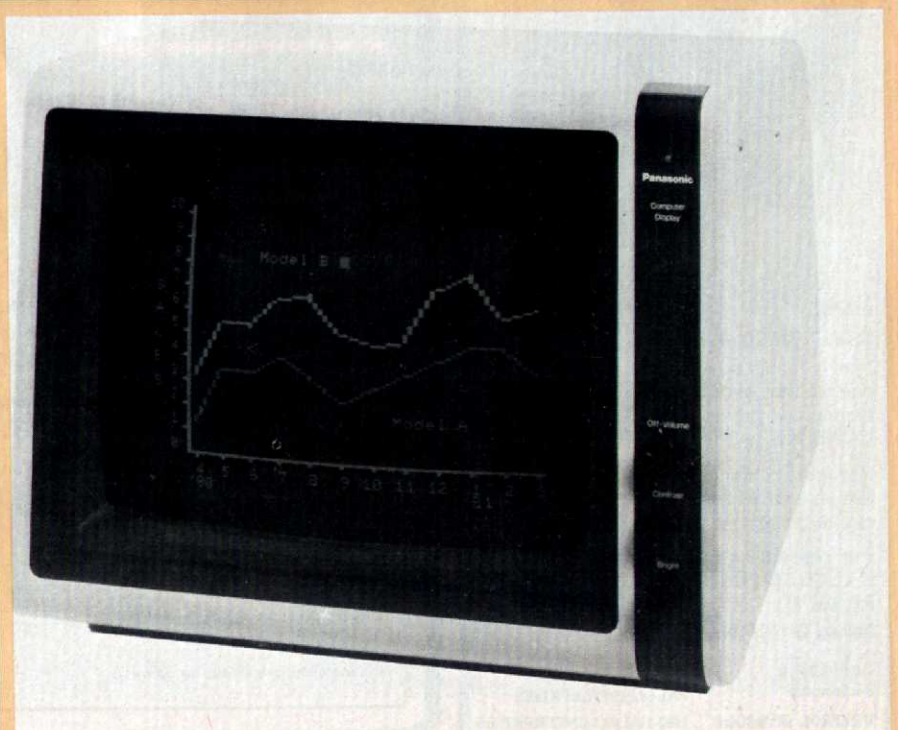
come out like this on the VIC:

```
20 PRINT "SELECT ONE O
F THE FOLLOWING
30 PRINT "PRESS THE LE
TTER BESIDE YOUR CHOIC
E"
```

It's messy and difficult to read because so few characters can be shown on one line. Other computers have higher capacity displays. The Panasonic JR-200, Timex/Sinclair 1000, and TI 99/4A, for example, have 24 lines of 32 characters. That's better, but I prefer a minimum of 24 lines of 40 characters. The Apple IIe, Atari, Commodore 64, Spectravideo, and Mattel Aquarius all have 24 lines of 40 characters. One computer, the Timex Sinclair 2000, has two different display formats. If you use it with a color television, it generates a very readable 24 lines of 32 characters. If you connect it to a video monitor it can display 24 lines of 32 characters. If you connect it to a video monitor it can display 24 lines of 64 characters. That's great because you can start using the computer with a color television you already have, but you aren't limited to the display format a television can handle.

If word processing and other professional applications are important, the capacity to look for is 24 lines of 80 characters. The Osborne I, Morrow MicroDecision I, Kaypro II, IBM PC, Eagle PC, and many more models have this format. You will pay more for higher capacity video systems, but it makes no sense to buy a computer that isn't suitable for the jobs you bought it for.

Displayable Characters—Some computers display little more than upper case



Panasonic's TR-120 MPDA monochrome amber computer display.

The Apple graphics tablet.

Amdek's new 13-inch color II professional monitor offers controlled high resolution color graphics for the IBM-PC.

letters and numbers. You will probably want more than that. Upper and lower case letters are a minimum requirement.

Many computers also have a set of graphics characters (e.g. a heart, club, spade, square, thin line, thick line, corners, and so forth). These characters are the same size as ordinary characters but can be used to create figures, pictures, and charts. Timex Sinclair and Commodore computers both have a nice set of graphics characters you can use simply by pressing the right keys on the keyboard.

Some systems also have complete sets of Greek or Japanese characters and special purpose symbols for music or scientific work. Look for a machine that gives you the type of characters you need.

Color—Computers with color displays have quite a range of color options. Some, like the Commodore 64 and the Atari models, let you control the color of the screen border, the background (called the playfield by Atari), and the characters. Ideally, the computer should be capable of using ten or more different colors on the screen at once, and it should be able to independently control the color of the border, background, and each character. Most don't give you that much control. Often the border color cannot be

The Morrow Decision I and the expandable S-100 multi-user, multi-tasking computer system.

Radio Shack's new MC-10 Micro color computer.

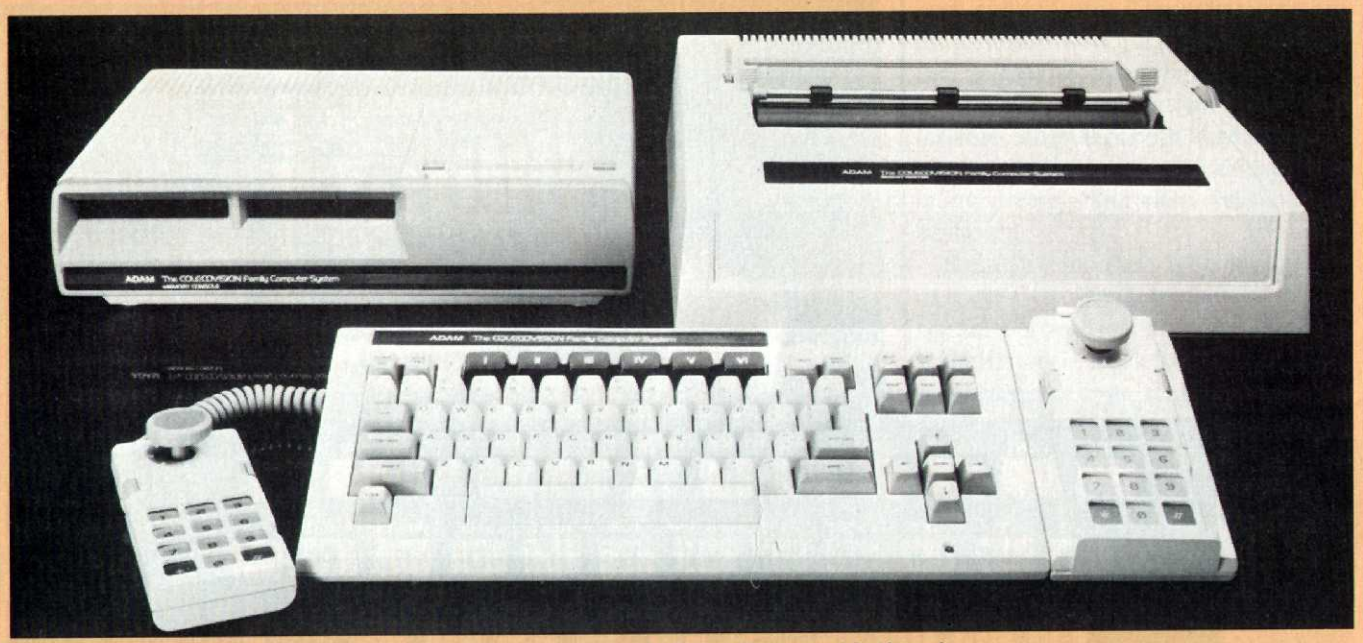
modified, or the range on colors is only one or two when you use high resolution graphics.

Graphics—Computers create their video displays by dividing the screen up into thousands of little dots. The computer can then control the color of each dot on the screen. The more dots there are, the smaller each dot is, and the finer the quality of the possible graphics. Each dot is called a picture element or pixel, and the quality of graphics possible is often described in terms of pixels. A high resolution (HI-RES) graphics display on a personal computer lets you individually control many different dots or pixels. The Laser 3000 computer from Video Technology, for example, has a 590 by 192 graphics mode. That means there are 590 individual dots on each of 192 lines on the screen or a total of 107,420 picture elements. With that many to work with, you can create some very fine grained (HI-RES) color graphics.

Two other graphics features besides resolution are also important. First, when comparing models be sure you're looking at specifications for individually addressable pixels. Some models create their characters out of an 8 by 8 matrix of dots and let you create any character you want in an 8 by 8 matrix. Those custom characters can then be displayed just like a regular character. If you want one dot in the middle of that matrix to be blue while all of the others don't show at all, it's possible. To control that one dot, however, you must also do something with the other 63 in the matrix. That means the dot isn't individually addressable; it can only be controlled by controlling the whole 8 by 8 matrix of dots that makes up a character. I should also mention that a few models give you both high resolution graphics with individually addressable pixels and the ability to create custom characters.

Another feature is the number of graphics modes possible. The Atari and Apple computers give you several different graphics modes. If you want low resolution graphics you can get them easily without the trouble of working with more complicated HI-RES graphics. In addition, you can mix graphics and text so that the top three-fourths of the screen is for graphics and the bottom is still available for text messages on the Atari. Having several different graphics modes makes a computer more versatile.

Sprite Graphics—A computer that has sprite graphics will let you design graphic figures in varying sizes (e.g. a spaceship, tank, cave monster, and so on). The sprite is made up of many different pixels, but you can control the movement and position of a sprite by giving an instruction to the sprite instead of to each of the individual dots that makes up the figure. Atari calls sprite graphics player/missile graphics but, regardless of the name, its a very versatile form. The Coleco, Adam, Commodore 64, and Atari computers all have at least some sprite graphics capability. Coleco's Adam computer can use up to 37 different sprites in one program; quite a bit more than most of its competitors.



The Coleco ADAM family computer system with memory console, Smart Writer and keyboard.

Sound

Sound synthesis features vary from none to something akin to the London Philharmonic Orchestra. There are several aspects to sound generation on a computer:

Pitch—This refers to the frequency of the sound and is the basic difference between sounds. The pitch of a sound is measured in Hertz (Hz) and the range of sound that can be produced by a computer is measured in octaves. A computer with a six octave range is capable of generating sounds across the entire frequency range we can hear.

Duration—All computers with sound synthesis can control how long each tone is heard.

Voices—Some computers have one voice sound generators which means they can only generate one sound at a time. Others have two, three, or four voice synthesizers that let you individually control up to four different tones at once. If you want three part harmony from your computer, look for one with at least three voices in its synthesizer.

Envelope—A pure tone is a sound composed of only one pitch. Most interesting sounds have a primary pitch and varying degrees of softer, secondary pitches. Some computers let you control how pure a sound is, and whether it is made up of a single pure tone or is richer and contains many different tones as well as one primary tone. In addition, some computers let you control the Attack/Decay pattern of a tone. Some sounds rise rapidly to a sustained level and then drop off slowly. Others rise and fall in a different pattern. This is called the Attack/Decay pattern.

Everything discussed above is sometimes called the envelope of the sound. The more sophisticated sound synthesis systems for computers give you more control over the envelope of the sounds generated. Computers such as the Apple IIe have relatively crude sound generation capacity while computers such as the Spectravideo models and the Commodore 64 have very sophisticated sound synthesis features. The inexpensive Timex/Sinclair 2000 has a four voice synthesizer with an 8 octave range. The Atari 1400XL and 1450XLD computers even have built-in speech as well as sound synthesis.

Atari's top-of-the-line 1450XLD.

Standard Output Interfaces

Hundreds of different companies manufacture printers, modems, voice synthesizers, digitizers, graphics pads, and who knows what else for the personal computer market. If your computer has a standard connection point (interface) it is often possible to buy peripherals from many different companies other than the one that made your computer. Buying from another supplier gives you more options and may save a considerable amount of money.

There are two popular types of standard interfaces for personal computers today—serial and parallel. If one or both of those are provided on your computer it is generally possible to connect the computer to all sorts of peripherals. Some computers, such as the Radio

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The Apple IIe personal computer.

Shack Model 4, have a parallel interface in even the least expensive version. Others such as the Apple IIe, don't have any standard interfaces. That means you must pay extra for the opportunity to use peripherals that require serial or parallel interfaces.

Mass Storage

I have already mentioned the two major methods of mass storage—cassette and disk. Cassette systems that use regular tape recorders are generally less reliable than ones such as the Atari and Commodore, which use a special recorder designed specifically for computer use.

Disk drives are available in at least fifteen different flavors, but almost all the ones used on personal computers are 5¼" types. Of all the differences between disk drives, two are most important—price and capacity. Prices range from around $300 for a disk drive system for the Commodore and VIC computers to over $600 for one disk drive and a controller card for the TI 99/4A. The first disk drive for the TRS-80 Color Computer is also expensive at $599. A reasonable price for a regular disk drive is between $300 and $500.

Ironically one of the expensive disk drives, the one for the TI 99/4A lets you store less than 100K of data on it. The cheaper drive for the Commodore 64 and VIC stores more than 150K on each disk. A drive that stores less than 100K is outdated today and will cost you more to use because less data can be stored on each disk. Disks cost from three dollars to six dollars depending on quality. Some of the better business computers let you store 200K, even 500K or 1,000K on a single disk, which means you can put the contents of ten TI disks on one of those. The higher capacity disk drives naturally cost more, but they also save you money in the long run because you use fewer disks.

In Conclusion

That just about covers it. The information provided in this article will help you think more clearly about the computers you're considering. Don't forget, however, that there are other factors besides the quality of the hardware. Some relatively routine computers like the Apple IIe have a huge software base for them. Average computers with a large selection of software are more useful than great computers with little or no software.

It's also fair to shop for computers with your heart as well as your head. With over 200 different models currently for sale in the United States, you should be able to find one that has good hardware specifications and has that feel and appearance that draws you to it. After all, liking your computer is as important as appreciating it. ▲

Adapted from *Computer's For Everybody Buyer's Guide* by Jerry Willis and Merl Miller, published by Dilithium Press.

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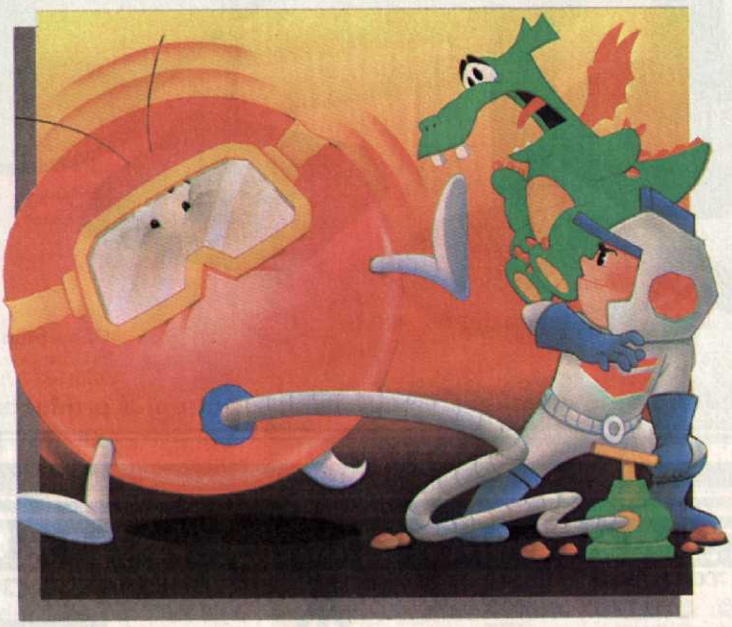
COMPUTER CORNER

Software Action On View

By Dawn Gordon and Dan Persons

DIG DUG

(Atari/ROM Cartridge)



At first, the main goal of this ROM cart game for Atari computers is not readily apparent. It's only after you have spent some time with this arcade adaptation that the goal becomes clear, and you may be surprised to find that this so-called "cute" game actually has a very aggressive theme.

In this one- or two-player game, your joystick controls **Dig Dug**, a little white-suited character whose job it is to dig tunnels under the earth. As you guide your character up, down, left, and right, essentially digging your own maze, you come under attack by a set of decidedly bizarre creatures. There are Pookas, which are little tomato-shaped fellows wearing sunglasses, and Fygars little green dragons who can breathe fire. Contact with either of these creatures, or with the Fygar's breath, means extermination for Dig Dug.

Pookas and Fygars start off each board in their own little caves, but don't think you can just avoid them by not opening up their branches. If you don't go to them, they'll come to you by turning into ghosts capable of both transporting through solid earth and of homing in on your man. Like it or not, you're going to have to contend with these foes sooner or later.

Naturally, you're not defenseless. Dig Dug carries an air pump that proves to be very effective against sentient vegetables and fire-breathing reptiles. Press the action button and a hose snakes out from Dig Dug in the direction that he's facing. If a Pooka or Fygar are close enough, the hose will attach to them and start pumping them up. One or two pumps on the action button will inflate them just enough to let your man slip by, while a few more pumps will explode them.

The points you receive for blowing up a creature depend on how close you are to the bottom of the screen as well as whether you blew them up from the side or from the top or bottom. But if what you're after is points, then there's a much more lucrative way of disposing of your enemies. Encased in the earth are large rocks. If you tunnel Dig Dug up directly underneath a rock and then steer him away, the stone will break through the thin crust of earth that's left and come crashing down on any creature unfortunate enough to be underneath it. It takes a little practice, but eventually you will develop the skills necessary to stop two or more of the nasties with one stone. Taking out one creature in this fashion nets you 1,000 points, two creatures earns you 2,500 points, three gets you 4,000 points, and so on. After you have dropped two rocks, a bonus veggie will appear that, when picked up by Dig Dug, is worth from 400 to 7,000 points, depending on what skill level you're playing at. There are ten different skill levels, with each distinguished by the number and speed of your adversaries. You start out with three lives and can, of course, gain bonus lives, depending on your score.

The morals of Dig Dug may be a bit hazy, but I can't deny that the game is good. The translation from the arcade original, if a little less detailed, is accurate. The sound track, featuring the infectious Dig Dug theme, is wonderful. The only sticking point for me, aside from the theme, is the maneuverability of Dig Dug. While it at first appears that you can dig tunnels anywhere you want, this isn't actually the case.

Dig Dug can move along the paths of an invisible grid which gives the impression that the joystick control is less responsive than it actually is. If, say, Dig Dug is traveling upwards and you want him to go left, he won't actually change direction until he hits an intersection in the grid. It doesn't take too

long to become accustomed to this peculiarity in game play but, until then, Dig Dug's apparent refusal to allow himself to be guided can prove to be a little frustrating.

Chances are good, however, that most players will enjoy the game. Though its aggressive game play belies its cute and cuddly exterior, it's still a contest with attractive visuals and wonderfully addictive game play. In the realm of digging games, it's one of the best. —*D.P.*

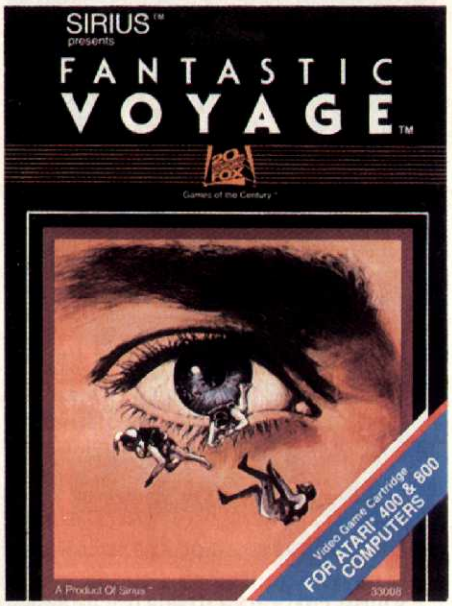
FANTASTIC VOYAGE
Atari 400/800 ROM Cartridge
(Fox Video Games)

When **Fantastic Voyage** first hit the theatres I saw the film three times and, at each showing, I nearly jumped out of my seat with enthusiasm when the heroes had to pry off antibodies that were clinging ever so closely to Racquel Welch's body. I was hoping that Fox Video Games was going to somehow recreate that memorable sequence in this ROM cart game for Atari computers. No such luck. I guess they have saved such fun for their Porky's video game. What we must concern ourselves with is saving lives.

In this one-player game, your joystick controls a ship that has gotten *really* small and is travelling trough the bloodstream of a seriously ill human being. Left and right on the joystick moves you horizontally, up and down moves you vertically. The higher your ship is on the screen, the faster you move.

As you maneuver through the vertically scrolling artery, you encounter antibodies, enzymes, bacteria and other microscopic inhabitants. You must blast these creatures with your laser, since letting them slip past your ship harms your patient, as does letting them run into you or letting your ship bump into the walls of the artery. Zapping the key-shaped enzymes (a clever little biological in-joke) helps heal your patient. But the poor soul won't be completely cured until you confront the killer blood clot. This medical monster blocks the end of a narrow, winding artery and requires fifteen direct hits to kill.

If it seems that Fantastic Voyage resembles a sort of vertically mounted Zaxxon, you wouldn't be far from wrong. Aiding the illusion along are the "defense cells," little creatures that travel horizontally across the screen and serve the same function as Zaxxon's vertically launched rockets. In fact, the defense cells are even shaped like rockets.



What is decidedly un-Zaxxon about this game is not only your ability to control your ship's speed, but also the importance of time. Stay too long zapping bacteria and your patient will waste away, indicated by the decreasing motion of the heartbeat indicator located at the bottom of the screen and the speeding up of the heartbeat on the sound track. Successfully completing a round becomes a matter of deciding how much time you should spend on battling the more plentiful invaders before zipping off to take on the killer clot.

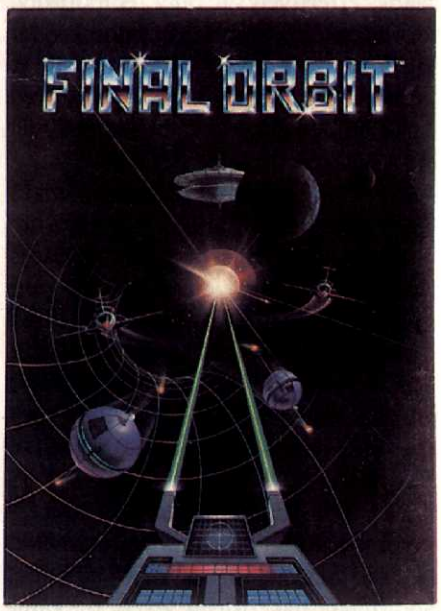
With Fantastic Voyage, Fox Video continues their practice of taking the scenario of an established game and tagging on the name of a famous movie in order to convince the public that they're buying something completely different. I normally object to this technique, but, fortunately, Fantastic Voyage has enough original elements to make it stand on its own as an entertaining shoot-'em-up. Graphics and sound on this version are not much different from those of the original version of the game, which was created for the Atari 2600. The simple images get their point across but, when you consider the capabilities of the Atari computers, you can't help but think that things could have been done with a lot more flair.

FINAL ORBIT
Atari 400/1200XL Cartridge
(Sirius Software)

So you thought you heard it all. Well, try this one. The Maladroid forces are attacking Earth (no doubt they want all our copies of Donny & Marie's Greatest Hits) and you're the only person who can stop them. In **Final Orbit** you're armed with a laser cannon for blasting ships out of the sky before they weaken Earth's defenses and blow our little world to smithereens.

Every time they manage to hit the planet (a yellow flash appears) it is weakened, and the same goes for your cannon (a blue flash), so you must put the Maladroid ships out of commission by lining them up in your finder and shooting. Your cannon's movement is horizontal, but it can be raised vertically to track the enemy targets. Radar is provided for a long range scan of Maladroid ships, and to regain energy you must find an enemy base ship and destroy it.

This is easier said than done, since you must track a Maladroid fighter with a white strip across its back and follow it around the screen for at least five seconds. At that point the base appears, and you must move quickly in order to blast it away. When you destroy a base ship, or any other enemy target, a red flash appears to let you know that you have gone one step further toward saving the world.



Final Orbit has very rich colors, with a Star Wars-style blue aurora around Earth. The sound isn't bad, but the radar is. All the radar screen seems to

show is a small point of light that doesn't seem to move in any direction. Apparently, it is a useless device because you're always aware that enemy ships are coming — they never stop. As in other Sirius games, by depressing the joy button you get continuous firing, and you also get a warning signal when your energy supply is running low. —*D.G.*

SQUISH'EM

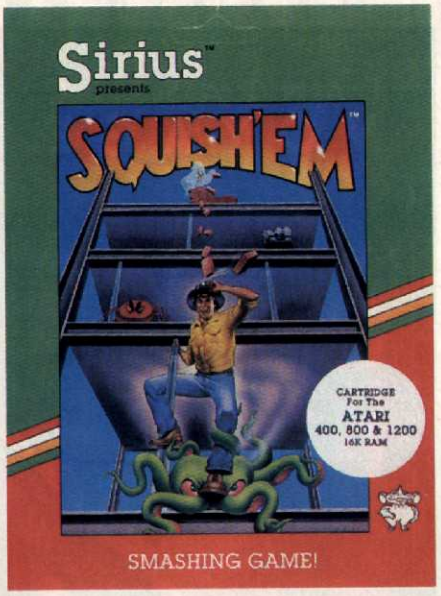
(Atari/ROM Cartridge)

The designer of **Squish'em**, Tony Ngo, seems to have brought a down-to-earth pragmatism to this ROM cart game for Atari computers from Sirius. In this one-player game you use your joystick to guide your on-screen man up the framework of a forty-eight story building. As you maneuver up the side of the vertically scrolling structure, you're menaced by a variety of creatures that, for the most part, look like various species of insects. If these insects touch you from the side, you lose your grip and tumble down the building.

You can avoid the creatures by moving over to a vertical pipe and skittering up to the next floor. You can also dodge them by pressing the action button to briefly raise your climber's feet, allowing the bug to pass underneath without harming you. What I like best about this game is when you press the action button at the appropriate time, your climber automatically lowers his feet, coming down full square on the creepy-crawlies' heads, effectively, if only temporarily, squishing 'em. It's fun, but don't loiter too long on a level, either waiting to squish a bug, or after a bug has been squished. You might find yourself facing a couple of unpleasant surprises.

For one thing, there are falling bricks that drop at regular intervals and can only be avoided by sliding horizontally. For another, any creature that gets squished is eventually resurrected as an indestructible, and decidedly meaner, white creature. The longer you hang around one level, the greater your chances of encountering one or both of these hazards.

Get to the top of the building, touch a suitcase placed there, and you start over at the bottom of a new building. Squish'em has fifteen levels of game play, at three levels per building, with the creatures getting craftier and harder to squish as the levels advance. Meanwhile, the vertical pipes that permit you to move up to the next floor become fewer and fewer, forcing you into more and more confrontations with the little buggers. Your man starts out with three lives and can gain lives by picking up bonus prizes that are located on each building.



Squish'em bears a strong resemblance to Crazy Climber, only better. Unlike CC, where your climber is defenseless and has no other choice than to dodge the various creatures and objects that he encounters, in Squish'em your man has the capability of striking back at his tormentors. Aside from the points that you earn from squishing the varmints, there's a wealth of satisfaction to be gained in taking out your aggression on the little critters.

Of course, there's more to Squish'em than just the "revenge is sweet" factor. The game is surprisingly fast-paced with joystick control being tight and accurate. The graphics are colorful and imaginative, with a wide variety of creatures. As for the sound effects, they include the little squeaks of the creatures as they move back and forth, along with some offbeat tunes that play when your climber advances to a new level.

Squish'em is one of the odder games that I've come across, and yet it's also a real charmer. It's easy to learn while being witty and challenging. Best of all, it never becomes too cute for its own good. Adults will enjoy the offbeat situation and the challenge, while younger players will get into the sound effects and the bright, colorful graphics. Could this be the fabled "family game?" Maybe so. Right now, I'll settle for "fun," and Squish'em is definitely that. —*D.P.*

DEADLY SKIES

(Tronix/VIC-20 ROM Cart)

What do you call a game when it combines Defender, Asteroids, Space Invaders, Missile Command and Circus Atari? Well, while Tronix has put bits of each of these classics into a ROM cart game for the VIC-20, they have not seen fit to title it honestly. Instead, they have decided to call this particular game **Deadly Skies**.

In this one-player game your joystick controls a helicopter that's flying over a constantly scrolling enemy military base. Using the fire button to drop bombs, it's your job to chip away at the two-layer, scrolling protective cloud cover and destroy the various buildings and tanks that comprise the base. Meanwhile, the enemy is shooting at you with rockets that travel straight up the screen and smart bombs which travel in a diagonal path shadowing the movements of your helicopter.

There are UFO's that drop bombs from above and indestructible asteroids that cover horizontal paths across the screen. Clear out an enemy base and you start over on a new base with more and faster missiles and asteroids. There are 32 levels in all, with the last 16 repeating the first 16 at a faster rate. You start out with five helicopters and gain a bonus helicopter for each 10,000 points scored.

After all is said and done, this is about the most mindless game I've come across in a while. Flying low and keeping your finger on the fire button will just about get you through the lower levels, while the higher levels merely require you to keep an eye out for the various asteroids and missiles. There is an attempt at varying the game play from wave to wave, however. One board may be crammed with asteroids, another may have a rain of missiles or smart bombs.

It's all for nothing since the Tronix graphics suffer greatly. Everything is drawn using building block-like custom characters, resulting in visuals that aren't so much complex as they are just plain crowded. At times the screen is so full of objects, all of them animated with jerky, stop-and-go movements, that you have a hard enough time just trying to locate your helicopter.

Deadly Skies isn't such a bad idea. Unfortunately, the game falls victim to programming techniques that are not

suited to it. At lower levels there's no challenge, while at higher levels it's a pain to play. The VIC has to be capable of more than this. Tronix has already demonstrated that custom characters can be used to create involving, original games, such as Scorpion. I just wish that they would exercise a little more judgment in their selection of game concepts. —*D.P.*

SCORPION

(Tronix/VIC-20 ROM Cartridge)

A scorpion is probably the last creature I would want to see as the champion of a video game. Let's face it, there are not many qualities possessed by scorpions that I can identify with. Nevertheless, Tronix designer Jimmy Huey has gambled that people will play a game featuring this loathsome animal as its main character. The result is **Scorpion**, a ROM cart game for the VIC-20 that, surprisingly, turns out to be much better than I could ever have dreamed possible.

In this one-player game of survival, your joystick controls a scorpion that must forage for food in a horizontally and vertically scrolling maze. At the beginning of each round, four frog eggs are scattered randomly throughout the maze. Using a scanner placed to the right of the main screen to locate the eggs that are outside your field of view, you must guide your scorpion through the maze, retrieve an egg by touching it and bring the reptilian munchie back to your home, which is a pulsating square located near the center of the maze. The first egg retrieved earns you 400 points, the next is worth 800 points, and so on until the fourth egg wins you a whopping 3,200 points.

Of course, it isn't that simple. For one thing, eggs, if not quickly retrieved, will hatch into frogs with a strong instinct for survival and a touch that's deadly to the scorpion. These frogs can be temporarily stunned by hitting them with your scorpion's venom, which is shot in the direction your scorpion is facing when you press the joystick's fire button. Once stunned, a frog can be retrieved and brought back home for decidedly less points.

In addition, you must contend with a variety of other creatures, all of them bent on doing you grievous, bodily harm. Worms, dragons, and stalkers can all be dispatched with your scorpion's venom, but watch out for the pods. These pulsating green dots, when hit, give birth to six pod babies which, like the swarmers of Defender, waste no time in trying to do your scorpion in. If this weren't enough, you also have to worry about a dwindling oxygen supply, represented by a shrinking bar near the top of the screen. The only way to replenish your oxygen is by shooting the Venus's-flytraps that grow in profusion throughout the maze. If you somehow manage to capture all four eggs or frogs, you're moved to another, more difficult maze.

There are three modes of play, easy, normal, and hard, as well as 32 skill levels within each mode. You start off with five scorpions and, depending on which mode is selected, gain a bonus scorpion for each 2,000, 4,000 or 8,000 point levels.

If the scrolling maze and long-range scanner of Scorpion bear a passing resemblance to Commodore's Radar Rat Race, that's about the only thing that these games have in common. Where Radar Rat Race strove for cuteness with its theme of rodents chasing after cheese and its repeated, and eventually monotonous, rendition of "Three Blind Mice," Scorpion seems to have been designed to be as weird as possible.

The whole idea of chasing after yummy frogs is bizarre enough, but then you have a maze packed full with a strange assortment of predators, each with its own peculiar personality traits. The strangest of these creatures has to be the pod babies, who sprout up like mushrooms when the pod mother is hit, then scatter all over in their zeal to destroy you.

While each character has its own unique sound, the background effects are filled with a wide variety of hums, trills and ominous drones, all of them punctuating the urgency of your scorpion's mission. To complete your sense of displacement, the scanner only shows you the location of the frogs and your

scorpion within the maze. Thus, you're forced to divide your attention between the main screen, to help avoid obstacles and predators, and the scanner, to locate and track your next target.

If there was an award for most thoughtful design, it would have to go to Scorpion. Not only are there the requisite indicators showing you how many lives you have in reserve and how much oxygen you have left, but there are also readouts indicating how many points will be netted with the next egg retrieved, which level you are currently playing at, and what the next point level for a bonus life is.

A screen is included during the attract mode that shows what each creature is worth in terms of points. Most amazing, though, is an option that Tronix has dubbed their "Switch-Hitter." This feature switches a joystick's directions so that left becomes up, right becomes down and so on. This permits a left-hander to hold the standard Atari joystick with the firing button on the right side, making the stick accessible to southpaws without the need for any special adapters or internal tinkering. It's a welcome feature that should be incorporated into more games. —*D.P.*

SNEAKERS

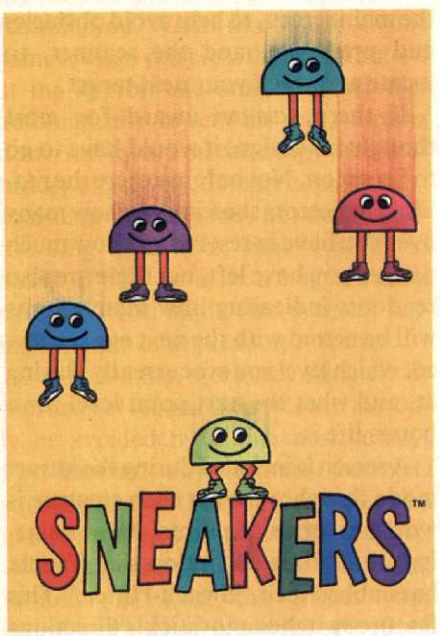
(Sirius Software
Atari 400/800 Disk)

If weird objects are your thing, then **Sneakers** will intrigue you. Everything from dancing sneakers to Cyclops, to Fangs, and even H-Wings (H-shaped things) will descend upon you. After you defeat all eight varieties, the next level kicks in (there are five levels in all) and it starts all over again, but, of course, faster.

You start the game with five horizontally moving ships, and a bonus ship will be included after completing each level of play. Points are awarded for each beasty killed, and additional points are added if you manage to eliminate an entire attack wave quickly.

Each type of creature has its own creative strategy, and all will try to come in contact with you spelling instant death. Because of each monster's various quirks, players will have to plan individual strategies to deal with each creature's attack formation and movement. The game's graphics are simple, but the colors are well-used, and the sound is amply modulated.

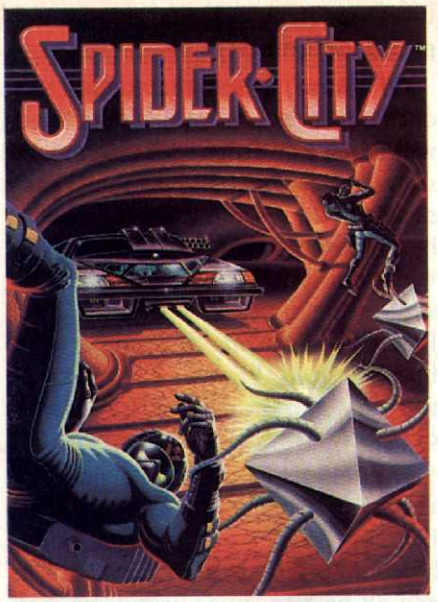
—D.G.



SPIDER CITY
Atari 400/800 Cartridge

(Sirius Software)

Even Spiderman would find this one difficult, as **Spider City** can test the reflexes of any player. Very similar in action and movement to Defender, the



game consists of a horizontal playfield with a tunnel map below. To win, players must destroy the city's hatching pods, and at the same time rescue the spacemen that appear.

Scoring is accomplished the usual way, by blowing away such menaces as patrol ships, pods, debris, generators and, of course, spider warriors. However, if the player isn't careful (or a sadist), and manages to blow a benevolent spaceman away, instead of saving him, 1,000 points are subtracted from the score. But points are awarded for quick thinking, and you can expect a higher score if you save lots of spacemen. Bonus points and an extra ship (you start with three) are also given for every city you destroy.

Joystick movement is fast, and it's easy to change the ship's direction from right to left. The graphics, however, aren't anything to write home about, and the sound is just adequate. But the player does get a fighting chance every once in a while, as a force shield can protect the ship for a few seconds after the player hits five spider warriors. Because the game moves quickly, it would be nice if more than just one player could join the action, but perhaps there's only room for one in Spider City.

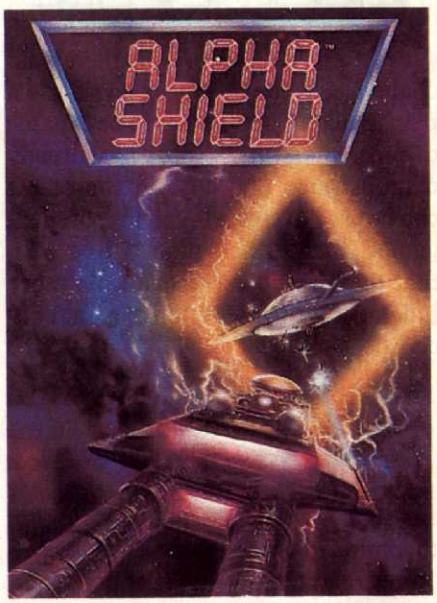
—D.G.

ALPHA SHIELD

(Sirius Software
Atari 400-1200XL Cartridge)

Alpha Shield is unique. Your mission is to destroy as many Alpherion Bases as possible by firing missiles through the gaps of the base's super-duper force shield. Fortunately, the gaps do appear frequently, but they do move around. So in order to blow the base away you must maneuver your ship inside the shield and blast it repeatedly. You start with five ships, and new ones are added when you destroy two bases or accrue 10,000 points.

A meter-type gauge at the bottom of the screen indicates when the base's energy is growing low, and each hit will weaken the base further. When the needle points to the left the base blows up. Of course it isn't that easy, as enemy missiles (heat seekers, bouncers, wanderers, homers and fireballs) will do their darndest to send you to oblivion.



The best strategy seems to be to stay toward either side of the shield and keep blasting. This way you can at least weaken the base at intervals, and also get a couple of missiles at the same time. When the right space appears get inside the shield and fire. Since the control button can effect continual firing it's easy to blast the base away in a matter of seconds. But as soon as one base goes bye-bye another one appears. And as the game progresses more missiles will follow your ship, and other barriers will protect the base from harm.

Alpha Shield has some interesting graphics, but eventually the Alpha Shield will begin to get on your nerves as it often repeats the same movements over and over again. However, the play does get exciting at points, especially when the shield starts to contract with your ship inside. The sound is quite adequate, and at times produces some very interesting reverberation effects.—*D.G.*

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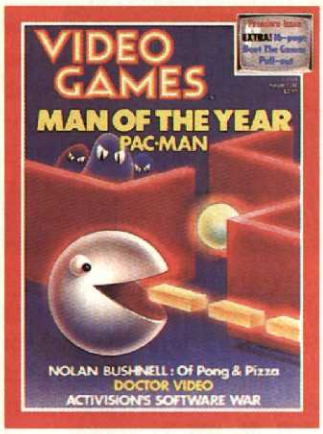

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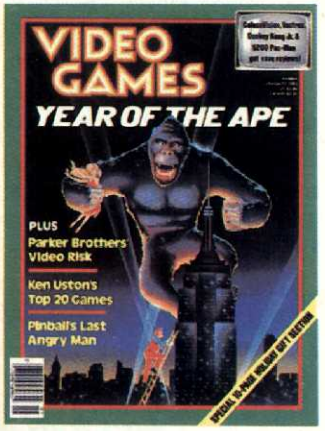

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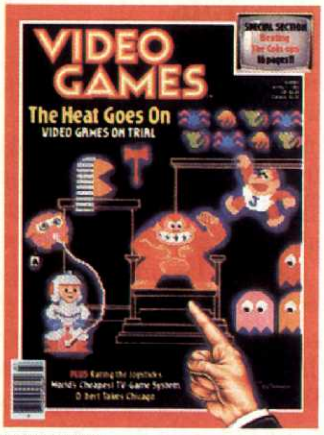

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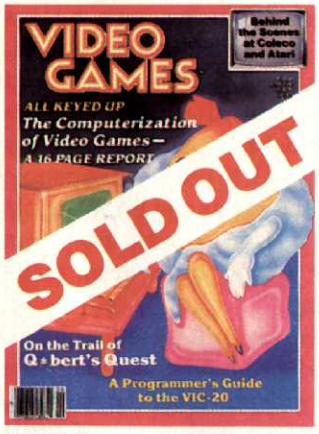

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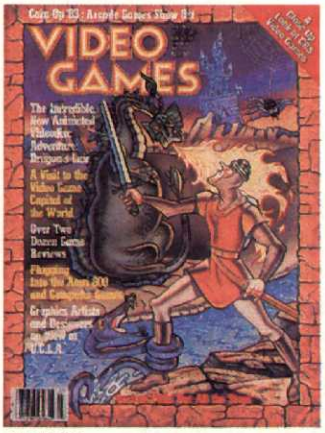

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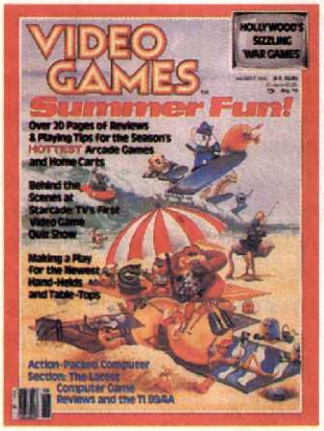

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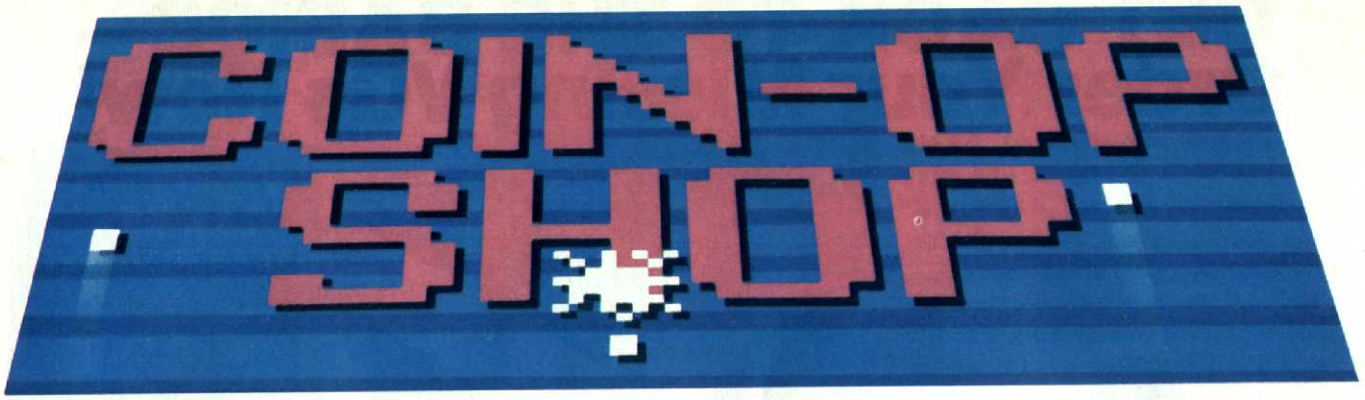


ARCADE '83: THE YEAR IN REVIEW (SO FAR)

By John Holmstrom

When we eventually look back, 1983 will best be remembered as the year that coin-op laserdisc games first made their appearance. But for people in the arcade business '83 was bad news, with business falling by as much as 40 to 60 percent across the nation, depending upon whose figures you want to believe. The argument that home games hurt the arcades lost some credibility, since home game sales were as bad as, or worse than, arcade sales. A big problem was oversaturation—too much of a good thing as well as too much of the same thing. Video games were appearing everywhere, from movie theatres to fish stores to sidewalks. 1983 was also the year video games began to slowly disappear from the arcades, replaced by the hockey game Chexx, pinball machines, and other novelty games. People became bored with the same old video games, and either weren't interested in the new versions, or didn't feel like investing twenty to fifty dollars to learn how to master them. Lost in the doom and gloom were the advances made by video games, especially in sound and graphics, as well as evolving new hardware systems. Since they didn't affect game play, many of these changes weren't evident to the average player.

The hit of the year, so far, has been Atari's Pole Position, the most realistic driving game to date, as this coin-op video giant experienced a string of successes. Xevious, also an Atari/Namco effort, provided the most realistic graphics that a science-fiction game ever displayed. Admittedly, realistic graphics will be fully realized when videodisc technology becomes perfected. In the meantime, conventional video graphics may have to become more stylized to compete, such as Atari's third big game, Star Wars, an incredible vector graphic simulation of battle scenes from the movie. These games helped put Atari on top of the arcade best-seller lists for the first time in years. Millipede, their successful Centipede sequel, certainly helped, although Arabian, Food Fight, Liberator, Quantum, and their first conversion kit, Black Widow, did considerably less.

If Atari had some good news, not everyone else did. Gottlieb (who have since changed their name to Mylstar), thanks to Q*bert, had some great news. Previously relying heavily on its pinball games, the company scored their first ever video game hit, complete with a big splash at the AMOA convention, heralding heavy licensing, and a gig on a Saturday morning cartoon show. Mad Planets and Krull were not as splashy, but did feature hardware technology advancements. However, the year is far from over for the Northlake, Illinois legend.

Stern, a one-time pinball company that experienced the ups and downs of the video explosion in recent years, went heavily into conversions, licenses and whatever else to bring us Bagman, Lost Tomb, and Minefield, as well as the three-dimensional effects of Dark Planet and Mazer Blazer's unusually large gun. Stern's different approach to the video slowdown has been controversial but interesting to watch, although the movement by this company seems to be in the further development of video card games.

Williams released more pinball and bowling machines than videos in 1983. Maybe they read the writing on the wall. Just when it seemed they could do no wrong after producing such hits as Robotron, Defender, Moon Patrol, and Joust, Sinistar and Bubbles proved they were human, after all. The all too common criticism levelled at too many games this year was heard when people talked about Sinistar and Bubbles, "If only these had come out a few years ago. They would have been really popular then."

Bally/Midway, still big in the pinball world, produced more than a model a month. As with the rest of the business, there was some good news and some bad news. The good news was Baby Pac-Man, a pin/vid hybrid that introduced flipper play to a new generation that had never tried it before, while convincing a few diehard pinball holdovers to try Pac-Man. Baby Pac-Man's success also pointed out play dissatisfaction with the overabundance of standard video play.

The bad news was that many of Bal-

ly's other games, including Domino Man, Wacko, Kozmic Krooz'r, and to a lesser extent (it actually performed well, but not that well) Satan's Hollow, were not received well. This seemed to be a recurring problem for products developed in-house, although even licensed efforts, such as Mappy, Journey Escape, and Bump'N'Jump failed to arouse much interest.

Not to say that Bally, the Pac-masters, are crying over split energizers. They can laugh all the way to the casino. Super Pac-Man, Pac-Man Plus, Professor Pac-Man and the Baby-Pac all contributed to the industry within an industry. Mr. and Mrs. Pac are still king and queen of the video business, eating up quarters, players, and merchandising dollars everywhere they go. The writing on the wall has their phone number next to it though. If things are on a downswing, it's because people are finally losing interest in the yellow gobbler, and the fad has worn thin.

Having been active in the coin-op business for many years, in fact, Sega at one time produced a number of pinball machines for Japanese players, the company has emerged as a force to be reckoned with in video. Star Trek was a successful, shrewd, and accurate simulation of the best science-fiction television show ever. It was also the first game of 1983 to show that vector graphic games were not dead by producing colorful and realistic linework. The split-screen game play, single-spaceship capability, and unusual bonus values provided the player with more realistic alternatives. Then there is Astron Belt, not released to the general public domestically until now, was the industry's first look at laserdisc technology and will no doubt be an entry in the race for the number one disc game.

Champion Baseball may be Sega's triumph of the year, however. By providing video players with a version of the National Pastime that incorporates basic fundamentals of baseball in addition to solid 3-D color graphics, the California manufacturer proved it could produce a great game that's not a science-fiction shooting effort or Turbo. The mystery was why Buck Rogers, the game that had everything, failed to be the big hit that the pundits (yours truly included) predicted it would be.

A few years ago, Nintendo shocked the experts by producing and distributing Donkey Kong on its own, becoming an overnight success in the process. Popeye was their biggest hit since Mario and the Monkey made their debut. By relying on the jumping and climbing cartoon format, Nintendo has produced some safe and satisfying games, but there's also an inherent problem. There's nothing for the more daring and adventurous players. Donkey Kong may be going the way of all fads and might have run out of gas, unless the Saturday morning cartoon show takes off. It will be intriguing to see if and when Nintendo departs from the format it's imposed upon itself.

Taito, who years ago shocked the world with Space Invaders, is becoming a force to be reckoned with in America. Frontline was a surprise sensation, as was Jungle King, until, due to some problems from the Edgar Rice Burroughs' estate, it became Jungle Hunt. Zoo Keeper has also done pretty well. By relying on solid game themes such as war, jungle adventures and animal hunts, Taito has managed to keep trying new formats such as their latest game Elevator Action.

The story of the year is the laserdisc, which seems to be capturing the hearts and minds of players and public alike.

Centuri's Gyruss, licensed from Konami, was a surprise to anyone who listened to its heavy metal sound track, but it all made perfect sense. Gyruss was the most successful of all the post-MTV games that chose to fight fire with fire and competed with rock music on its own level (others include Mad Planets, Journey Escape, and Krull). It simply added an existing rock sound track to a sci-fi game, and it worked beautifully. Centuri's other good one was Time Pilot, also licensed from Konami. Rapid fire shooting helped turn the trick, as did a modern day war theme that is becoming very popular. But this Hialeah, Florida-based manufacturer was ready to break loose with some new technology applications that would ensure its continuing presence in the marketplace.

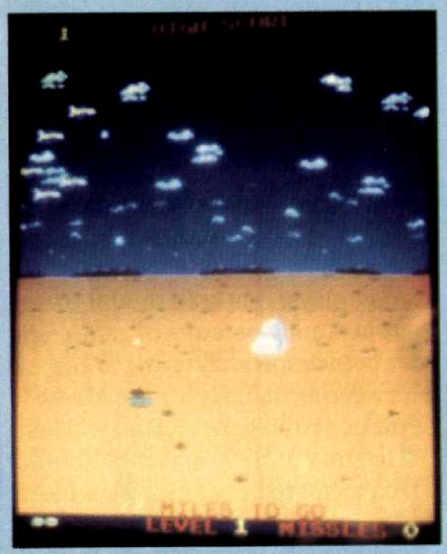
Mr. Do! from Universal came out of nowhere to become the most popular conversion kit of the year. By combining the familiar game play of Dig Dug with a loud cartoony sound track, it captured a big audience that seemed to include players of all ages.

As a result, conversion kits were viewed as viable alternatives for transforming over older machines into newer, more alluring attractions. By and large, the advancements in this area haven't been readily apparent to the average player, but are a soothing balm to owners and operators of games who have been desperately trying to keep up with video technology in its mad rush to be the newest, biggest, fastest and best.

The story of the year is the laserdisc, which seems to be capturing the hearts and minds of players and public alike. Cinematronics wins comeback company of the year award for escaping the grave of fiscal insolvency and being the first on the block with not only the first, but the best disc game imaginable. By the end of the year there will be dozens of laser games crowding out Pac-Man, Donkey Kong, and Robotron games. Further advancements in traditional computer graphics systems will also be coming out over the next year, doing their best to make you forget you'd ever played a laserdisc game. Better times are ahead for video games, barring war, natural or cosmic disaster.

Oversaturation of video games hurt the arcades, but music videos, considered by many to be video games' big competition, are getting overexposed. A million rock video programs are springing up on commercial as well as cable television, and there are video jukeboxes popping up around the country as well. Soon everyone will be as bored with rock videos as they are with Pac-Man. What will be interesting to see is if video games and music will ever successfully marry each other as movies and games have, given *WarGames* and *Star Wars:* the coin video experience, or as music and video converged in *Flashdance.*

Stern's



The military theme has been a constant in video games, with any number of variations over the years, including the recent Taito hit, Frontline. Admittedly, many shooting games rely on war themes, but 20th century warfare has a unique appeal. Somehow, the conflict is more realistic and believable than a cosmic space battle.

Stern's Minefield (designed by Chris Oberth) features a rousing instrumental chorus of "Off We Go Into the Wild Blue Yonder," the theme of the Army Air Force in World War II. The setting is the conflict in North Africa, where your American tank battles the Afrika Korps. Your tank battles bombers (250 points each), halftracks (270 points), missiles (290 points), tanks (310 points), helicopters (330 points), jeeps (350 points), and jets (370 points). Minefield's controls are the ever-popular twin eight-way joysticks, the left for movement and the right for firing your machine gun. There's also a cannon button to the left of the machine gun stick.

The game begins when the Transport Vehicle drops your tank off in the desert. You then must maneuver the tank around land mines, picking up missiles along the way (200 points for each). There are various enemies to contend with which appear in thirty mile waves: first bombers, then halftracks, bombers and halftracks, and so on. If you collide with any enemy vehicle, hit a land mine, or get hit by enemy fire, you lose a tank.

Once you've travelled thirty miles (a graphic at the bottom of the screen keeps track of the mileage), the Transport Vehicle will drop by to pick you up. It will hover around until you dock, to carry you into the next wave of action, which increases in difficulty. After every third wave, you must destroy the enemy headquarters, while avoiding machine gun fire and land mines, with each one of three sections having to be blown up individually. The missiles, fired by the cannon button, will do this easily and effectively, although if you want to make it more difficult, you can attempt it with your machine guns only.

Minefield's graphics resemble Rescue, a recent Stern helicopter game. Both feature nighttime effects every third wave and utilize three-dimensionalized images with clouds and distant objects aligning in varying perspectives. The game play is also similar to Rescue, so much so that Minefield might be thought of as a Rescue Deluxe on the ground.

Despite the similarities, I found Minefield to be a much better game than Rescue, and a solid one overall. For one, this type of war theme hasn't been done to death and whereas tank games are usually slow and cumbersome, the action in Minefield is fast and furious. Each of the enemy targets presents unique challenges, in a fairly solid package.

Minefield is a good war game with plenty of action, variations in play, and a host of enemies. It's high scoring and the bonus settings are usually generous (they're operator adjustable). War-lovers and video game players alike who are looking for a new shooting game shouldn't overlook this one.

Starcom and Cinematronics'

DRAGON'S LAIR

Dragon's Lair first exploded on the scene at the AOE trade show in late March *(Video Games* July issue cover story). Only a few scenes were shown in Chicago, about seven percent of the entire game. But it was obvious even then that it would make a big splash once it hit the arcades. Not only would it be the first laserdisc game to appear in America, it unexpectedly used first-class animation in a familiar but imaginative story of Dirk the Daring, a knight who fights off impossible odds to save the beautiful and sexy Princess Daphne. When it finally arrived, it was so unusual that dozens of people stood around it and watched or played in delight and amazement.

The question that people in the industry asked was, "Does the game have 'legs'? Can it be played over and over again, and attract a sizable audience over an extended period of time?" The answer is yes and no. Since its appearances nationwide in July, the game has generated incredible interest in all news media, while enough players are trying their hands to ensure the machine's financial success.

Dragon's Lair presents a totally different kind of game play than what players have been used to. There is a four-way joystick, and a "sword" button that's pushed when Dirk needs to use his weapon, but either doesn't really control his actions the way it would in other games. The controls must be pushed correctly at the right moment during a situation in the story's action to trigger Dirk's correct response to it. Hundreds of situations are presented including fire, floods, whirlpools, monster attacks and fighting the dragon, among others. And a visual or sound clue usually tips off the player as to the right action to take.

The lack of improvisation or experimentation can make playing Dragon's Lair feel like play-by-the-numbers. Push the buttons at the right places and you'll complete a picture-story. Originally, at the coin-op show, the impression one got from playing the demonstration was that the castle was built like a maze, and that the player could roam around its rooms at will. The finished product offers fewer options with only one way to play *correctly*. Also, in the AOE model, the game opened with one scene, the Room of Raging Fire, and if players didn't pass through it, safely, there was a second and third chance to try again.

In the arcade version, the player is faced with three different situations for each of his three lives. Many first-time players become so confused that they quickly retreat to more familiar fare. Although there is a scoring system, it's extraneous to the game. The object is to rescue the princess, and once you do, the story and the game are over. There are no higher levels of difficulty, and therefore no point to high scores.

The biggest disappointment, to me, is that the manufacturer stated that the blanking between scenes would be removed. Although it's not as bad as it was, it's noticeable enough to be a distraction.

Despite these few minor problems, Dragon's Lair is such a novel idea, and so well-executed, that it's one of the big hits of the year. Apparently there are so many requests for it that Cinematronics is having difficulty filling all the orders. The animation is amazing, far beyond any other arcade graphics and the story is solid, so that players get their money's worth even if they die quickly. This is especially true because Dirk dies in so many wonderful and funny ways. There are soft spots that are easy to play (the whirlpools and rapids, for instance) so beginners can grasp the unusual game play. The stereophonic sound is great, and the cabinet design is very attractive.

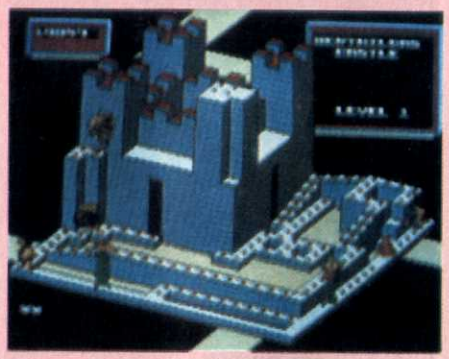
Playing Dragon's Lair brings back the feeling of the good old days, when crowds of people would watch someone play Space Invaders or Donkey Kong, and video games were something new and exciting. The player becomes a performer, showing off his talents and abilities in front of an audience. In some arcades, monitors have been placed above the cabinet so people can watch the action. As a portent of things to come in arcade games, Dragon's Lair stands apart from the competition as an effort that's as much fun to watch as it is to play.

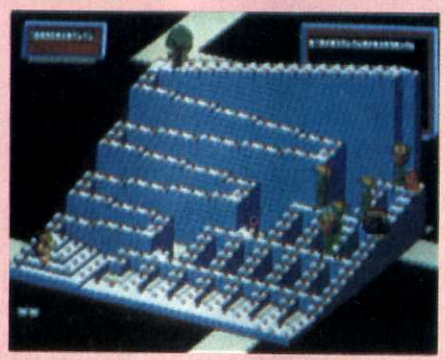
Atari's

At first glance, it may appear to be a cute game for children, but Crystal Castles is really for players of all ages. There are cartoon characters, colorful graphics, and the playing of March of the Wooden Soldiers music, but the complexity of the mazes and the sophistication of the play necessary to do well at it mark this as one video which can be appreciated by many types of game players.

Crystal Castles features a trackball with a jump button on either side to move the lead character, Bentley Bear, around a maze inlaid with gems. Every gem he picks up by travelling over it, is worth a consecutive point value—the first one is worth one point, the second two, then three, four, five, six, seven, and so on, until all the gems are gone for that maze. If you pick up the last gem, you're awarded a bonus that increases with every maze. If one of the other creatures who roams the maze, however, gets to it first, there's no bonus.

Bentley must avoid contact with any of the many creatures in this three-dimensional world, or he'll lose a life. You can jump him over any adversaries, but that's a calculated risk, since he can land in more trouble. The mazes, or castles, use floors, stairs, ramps, hidden passageways, elevators, and strange configurations to create one of the most challenging video games of this genre ever.

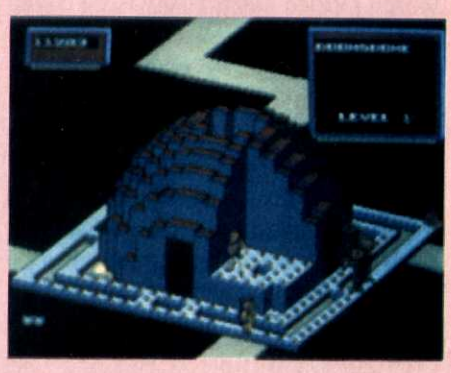




In terms of enemies to be on the lookout for, there are gem-eaters (one-eyed green monsters who can be erased for 500 points by hitting them while they are eating), trees (which can be stunned by jumping over them), the swarm (of bees, which float around whenever the action slows down), and Berthilda the Witch (who appears on every fourth maze wave. She can be killed for 3,000 points, but Bentley can only get her once he gains his magical hat which makes him invincible to all of the creatures on the board for a short period of time). This addition to the arsenal comes in very handy when you need to pick up the last gems.

Crystal Castles' graphics are amazing (no pun intended). Each Castle is "drawn" electronically on-screen in a few seconds, before the action begins. The first castle contains the letters of the all-time high scorer built into its structure, and if you reach the high score, castles in the next rounds conform to the shape of those initials.

Very realistic 3-D graphics highlight this fascinating, complex game. Characters disappear when they walk around a building or enter hallways. Only a faint silhouette lets you keep track of Bentley's movements when he goes into or behind part of the castle.



Each maze is much more difficult and challenging than the last, but the same strategies work for each. Clear off maze sections completely when travelling over them so you don't have to come back. If you leave gems behind, the creatures will try to block you off from them after you've completed the rest. It's a good idea to knock off as many gem-eaters as you can, although once they run out of gems to eat, they get mean and nasty.

If you score well in a game, you can

jump ahead to a higher level by jumping into a hallway (warp tunnel) in the first maze and pushing the jump button. This kind of welcome option is available in most Atari games, and here it not only serves as an inducement to play again at a higher level of difficulty with more men left, but it's also a reward of sorts for playing well, since the points and extra men are pretty generous.

The idea of combining a trackball with a maze game is interesting, and Crystal Castles is good enough for joystick players to enjoy and get used to. The pace is good, although the gem-eaters digest very fast, and players can usually set their own speed around the castles. There are no time bonuses and the penalties for going too slow, result in having to deal with the swarm as well as hungry gem-eaters. The jump button is more of a desperation measure than a strategic advantage, since you can't jump from one part of a castle to another, and there's not a great deal of control over where Bentley's going to land.

Last but not least is the cabinet, which is very striking and complements the total effect of Crystal Castles. It's a well-crafted game, one of the best maze variations to be introduced in a long time; and one only hopes that Bentley Bear doesn't get lost in the excitement and attention paid to Atari's other big hit of the season: Star Wars.

Taito's

Fueled by player interest in Turbo and Pole Position, comes another driving game variation from Taito called Change Lanes. The company didn't fare that well when they introduced Grand Champion around the time of Turbo, but this time, they've added the element of warfare to what would otherwise be a typical driving game. There is a story line about how, "Ever since the reign of Supreme King Juan Tutree—the leader of the planet has been chosen by the level of his driving skills." The Change Lanes roadway is supposed to be the supreme test of driving skill, and if you can reach the ninth level, you'll be crowned "Supreme Leader of the World."

The rules are outlined very clearly before the game begins. You can drive anywhere on the road or in the river. You can smash into other cars or anything else as much as you want. You'll waste fuel doing so, however, and once you run out of fuel (which is an easy thing to do) the game is over. If you can reach a checkpoint, your car gets refueled, and you gain bonuses for any fuel that's still left, as well as driving skill (speed). The bonuses start at 20,000 and go up to 50,000 points. Each checkpoint becomes progressively harder to reach than the last, as the courses become more difficult and the obstacles multiply. If you can make it to the fourth checkpoint, at which stage the 440,000 point barrier is broken, you're awarded bonus fuel, which is like winning a free car.

Other obstacles include bridges, land and water mines, icebergs, pylons, cars, and dead ends, all of which slow you down in the race. In the late rounds you also have to avoid deadly, heat-seeking missiles which can blow up your car.

Change Lanes is a very high scoring and fast-paced game. The basic strategy is to drive as fast as you can through the correct path to the checkpoints. The tricky part is finding and memorizing the correct paths. The checkpoints give

vague directions to the next ones, such as switch to brown lanes, or drive into the river. But once you're on the brown lanes or in the river you're on your own. Sometimes when you miss the lane change you have to back up. Thankfully there's a reverse/forward stick in addition to the gas pedal and steering wheel.

The best thing about Change Lanes is that you can drive very fast and smash into other cars without worrying about it too much. It's also such a high scoring game that even a terrible performance will net 100,000 points or so.

The main problem lies in the first person perspective three-dimensional graphics. There's a flat look to them, and the slope of the roadway is so extreme that it's hard to pick out the lanes you must change to. Although the war theme is a good idea (I always thought a World War Two jeep game, driving through enemy lines, would be a natural), it's not taken far enough. There's no war action here, but there is driving.

Change Lanes is a mediocre driving game that isn't as good as the other driving games which have been out longer. It's not a true test of driving skill, since you can make driving mistakes and keep playing. And to top it all off, there's the basic premise of the game. Don't you just wonder what kind of planet would choose its leader based on their driving skill?

Williams'

Imagine what it would be like to drive a motorcycle cross-country, while the worst drivers in the world are all around you trying to run you over. Well, that's what Motorace U.S.A. is like, and it's as close to the truth regarding life on the highways of America as you can get.

This newest game from Williams, via a license agreement with Irem, features a left-right joystick control, throttle button and brake button. You start from Los Angeles, making refueling stops in Las Vegas, Houston, St. Louis, and Chicago, and wind up in fabulous New York City, your final destination. You drive down the L.A. freeway, through the Vegas desert, over the Texas roadways, in and out of the Midwest backwoods, and around the treacherous curves of the industrial megalopolis of the east coast. Obstacles to your journey include cars, trees, puddles, rivers, bends in the road, rocks, trucks that drop barrels, and cactus.

The game is viewed from above the motorcycle, until you approach any one of the cities. Then it's time for the first person perspective three-dimensional graphics to take over. To the right of the game a score table indicates how much fuel is left, how far between cities your bike is, the cycle's speed in miles per hour, and your present ranking in the best scores of the day.

Once you reach a city, you gain a bonus for your speed ranking from 20,000 points for being number one to zero for a poor ranking, and a bonus for the fuel that's left. At this point, you pick up a little more fuel and take off again. You can pick up additional gas at random places on the route as well as bonus points for taking narrow paths or bridges (the values are indicated on the board); for doing wheelies (by driving over white strips on highways that are marked "wheelies"); or jumping over rivers (marked "jump").

You can crash as often as you like, similar to Taito's Change Lanes, but you lose a substantial amount of precious fuel when you do. Once you run out of fuel the game is over, but you can deposit another coin within ten seconds of the last game to start again where you left off. You begin the trip with 500 cc's, but the gas goes fast.

The graphics are as good as any driving game around (except Pole Position) and the game play is fairly realistic. The throttle button revs up the engine convincingly, and the brake feels just like the real McCoy. The highlights on the trip are the identifying details for the different geographical areas, such as palm trees in California, cactus in Nevada, and the picture postcard cities on the horizon as the motorcycle approaches. Once you reach New York, "VIVA N.Y." flashes, the Statue of Liberty waves, and the Star Spangled Banner plays. The game starts all over again from L.A., and you're awarded a full tank of gas.

I don't know too many people who'd want to leave Los Angeles to come to a dreary city like New York. If they did I don't think it would be to visit the Statue of Liberty, they'd want to check out the nightlife. The game would have made a lot more sense if you drove from The Big Apple to Hollywood, a la the Cannonball Run, where a beach bunny would beckon from the surf's edge.

Motorace U.S.A. is a better than average driving game. It's not too gimmicky, supplies some decent action, with more than a few highlights, lots of scenery, and there's always something new. I'm just surprised that it took this long for someone to think of a driving game that uses a motorcycle instead of a car. ▲

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THE FLIPSIDE

A Double Play Combination

By Zelmo

Well, the comeback continues to grow in magnitude as more and more game room owners and players are discovering the unique appeal of pinball machines. Seemingly cast aside when the video game boom was in full swing, flipper machines never really disappeared totally. The limited number of models which were built over the past year and a half, two years, were just difficult to find. But all this has begun to change in past months, with many in the industry pointing credit to the remarkable success of Bally's Baby Pac-Man.

This pin/vid combination served to introduce basic pinball action to what were, predominantly, a vast group of video players and incorporated the design and programming concepts into the workings of a standard, upright video game. The result, along with indications that other non-video equipment could be viable in today's market, gave impetus to a reappraisal of where pinball had been and where it might be able to go.

The results weren't all that surprising to many industry old-timers, since pinball had endured, in one form or another, for more than fifty years. To think that this type of coin-operated entertainment could suddenly lose its appeal, caused more than one individual to doubt that the final chapter had been written. After all, there was an entirely new generation of players who hadn't been exposed to the games and it seemed a safe bet that there was a place for something more besides the conven-

tional video machines which could be found everywhere.

Slowly and methodically pinball made its presence felt, not with all the glitz of multi-tiered playfields and fancy features, but models which offered standard flipper action for the novice and skilled player alike. It was as if there existed a shared sensibility between the remaining companies willing to try to keep pinball alive, that less might indeed be more.

This month's models are no exception to the rule, bringing back a design from another era along with a game that features a touch more than what might be apparent on the surface. The subtleties inherent in both are not so severe as to make the games overly confusing for the beginning player, which is, at least, one lesson that the current crop of pin games have in common.

Bally's GOLD BALL

Even with Pac-Man to their credit, Bally has remained committed to the belief that there's still an audience for pinball machines. In fact, two of their Pac spin-offs have incorporated flipper play, Mr. and Mrs. Pac-Man and Baby Pac-Man, in the hope that the games could capitalize on their names.

Recently, the company has recognized that simplified design can still deliver strong play action, although this time around a new concept has been added in. On the surface, Gold Ball features a very basic playfield with a minimum amount of target areas. The top of the board offers four lanes (P-L-A-Y) which must be completed in order to gain 50,000 points, an extra ball, and, finally, a special. Just to the right of this area is an opening leading down to the main field as well as a star rollover target, which when lit can mean an extra ball.

Move lower on the right side and three, almost vertically aligned, stationary targets (1-2-3) provide an opportunity for 2X and 3X multiple bonus values. Over toward the center of the board are three thumper bumpers for some good rebounding action back up through the lanes as well as to the sides. A spinner lane at the left allows for good access back to the top of the field. It is in the middle of the board, however, where the main feature is situated: a very straightforward three target bank consisting of a left and right stationary target, with a gold button target between.

In front of this area are letters spelling out G-O-L-D B-A-L-L and corresponding arrows indicating which letter will be lit if the center target is hit. The side targets, when hit, will move lit arrows either to the right or left accordingly. Completing this sequence will mean 100,000 points, 200,000 points and then a special, although getting all the letters even once is a task unto itself. To help in the effort, the designer responsible for the game has seen fit to add a right side curved lane which will spot an unlit letter every time the ball goes through.

Finishing off the layout is a deadly outlane at the right, while the left side features a curved outer lane which leads to the flipper as well as an interior vertical lane that offers almost no hope for a save. The setup has been used before, such as on the right side on Bally's Mr. and Mrs. Pac-Man.

The little extra to the game is the inclusion of an actual gold-coated ball which appears randomly during play (hence the name of the machine). When this occurs, all playfield values are tripled for that run, and getting the top right star rollover out before the ball makes contact with any other feature on the board will award an extra ball.

In terms of action, Gold Ball offers

some interesting play, not the least of which is trying to spell out the game's name and keeping the arrows in the right position to do so. However, there's also an inherent problem with the layout, since this primary target area can mean a straight down drain if hit dead center. So in trying to do what you're supposed to do, you run a greater risk of being penalized, which somehow doesn't seem equitable given the lack of alternative features to shoot for. Eventually, you have to go for the middle and hope for the best.

It's a frustrating situation, whether you're a beginner or skilled player, and really does take much of the fun out of the game. Even that lane on the right, for spotting a letter, is a difficult one to make on a repeated basis. This leaves the spinner lane as one shot, and that stationary target area on the top right as the other. A two-shot game, if you want to play safely.

Then there's the problem of the gold ball. You would think that if you could spell out all the letters (eight total), the reward might conceivably be a chance to play the gold ball. But this possibility has been taken away as something a player can earn by accomplishing a particular sequence of shots, and appears randomly. This fact bothers me, because the incentive has been taken away. It's a matter of chance and not skill, which diminishes much of what the game offers. As it is, the scoring is low and you can find yourself finished before you know it.

Gold Ball looks like a good idea which just wasn't executed to the degree it might have been, for whatever the reason. The rather sparse array of targets, although adequately balanced from top to bottom, isn't enough to sustain player interest over the long haul as this game, unfortunately, misses the mark by taking pinball basics to the extreme. Less this time isn't more, in terms of entertainment value.

Mylstar/Gottlieb's AMAZON HUNT

This legendary coin-op manufacturer may have recently changed its name, but the products it built a reputation on have endured. This company used to be synonymous with pinball, especially in the late Sixties and throughout the Seventies. And now, even though times have changed, the Gottlieb approach has been a return to those golden days, with former models being resurrected and updated for players who might not remember back to when they first appeared.

Back in the summer of 1975, a game called Fast Draw was released by the company and, obviously, someone must have liked it, because the game has returned under the guise of Amazon Hunt. There's new artwork and sound effects, as well as scoring values which have been updated, but otherwise the game is totally the same in terms of layout.

The top of the board features three lanes (A-B-C) in the middle, flanked by open areas on either side. This design alone makes the plunger shot that much more important if you're going to maximize any scoring at the beginning of each turn. Just below, at the left and right, are two stationary targets which will advance out-hole bonus values when lit. At the center are three thumper bumpers providing some good rebounding action, whether the ball is rolling down from the top or traveling up from the flippers.

Keeping the symmetry of design are two kick-out holes (one on either side of the board), before one gets to the main part of the game: two banks of five drop targets. There are dual lanes down to both flippers, which tie in with the top lanes for a chance to get A-B-C out. Doing so the first time will result in 2X multiplier value for out-hole bonus, and get it a second time and there's 3X to collect.

Even though Amazon Hunt features a closed-in playfield, with the main targets placed on the sides from top to bottom, the proximity of the drop targets tends to diminish what would otherwise be a self-limiting sensation when playing the game. The drop targets, which are at a slight angle outward toward the center of the board, will advance the out-hole bonus value by 10,000 points for each target hit. And, when you can complete both banks of targets, only the center black ones will come back up, worth 50,000 points if hit. So the scoring can be high if you're able to master this area alone.

By design, the play of Amazon Hunt is very simple, although it tends to be rather vertical in nature with very little lateral movement possible due to the placement of the features. A problem, which existed when the game was first introduced eight years ago, unfortunately hasn't been altered. The two kick-out holes, which when lit can mean a special, still aren't accessible by direct hits off the flippers. Instead, players have to hope that a shot back up to the top will somehow rebound around off the bumpers and land in the holes. This is less than a satisfying situation when the control is taken away from your hands and left to the chance of a lucky rebound.

The flaws of the game, above and beyond what has already been mentioned, include an out-hole bonus restricted to 140,000 points, without any multiplier values. This might seem to be a hefty amount of points, but once you've reached this level (even if it were only 14,000 points), you can't collect the amount via some feature on the board and then try to rebuild it up. You'll only get the total amount when the ball drains, so that play beyond this point on any given ball is limited once you maximize out the scoring. Instead of your rewards being increased for skillful play, you're really getting shortchanged.

Another problem, at least with Gottlieb games, has been the inability for players to get more than one extra ball on any turn. This tends to affect the continuity of play and might cause a player to feel cheated if all the rewards aren't attainable, depending upon how far you go in the game. However, as a basic, no-frills pinball machine with decent shots possible off the flippers, left to right and right to left, as well as via reverses, Amazon Hunt shouldn't be too imposing for the novice player. The same can't be said for the more skilled pinball player, who will easily tire of this game after a short period of time.

The question that remains regarding Amazon Hunt is that with all the models to choose from in the Gottlieb vaults, why did the company decide to bring this one back? The basic layout of drop target banks on either side of the board isn't that unique and had been done much better on other Gottlieb games. The hope here is that, if the company continues to go back in time for design ideas or total playfield layouts, they'll at least be more selective in what they choose so that today's players can have a better opportunity to appreciate just what pinball machines have to offer. ▲

SOFT SPOT

Home Cart Screen Gems On View

By Perry Greenberg and Dan Persons

Even though the sales of game systems have nosed-dived and computer software seems to now hold the spotlight and attention of manufacturers, game carts are still coming on strong. In fact, the competition has heated up for licensed versions of arcade hits. Atari, Coleco and, most recently, Parker Brothers and CBS Electronics are battling it out to get the rights to coin-op games, sometimes even before they've been released to the general public.

The result of all this action seems to indicate yet another massive surge in new releases. Many of these titles will be instantly recognizable if you've spent any time in arcades over the past year as companies are once again tapping this resource. The only difference is that more coin-op favorites will be introduced in time for the coming holiday season than ever before.

It is almost as if the manufacturers of game systems realize that this might be their swan song depending upon how sales go. With the popularity of personal computers crowding out the few survivors, the next few months will determine whether or not the old VCS, 5200, Intellivision, Odyssey and ColecoVision are going down for the count or can rally for a late round surge to hold on to the home market championship. In fact, how the new game cart selections go will undoubtedly influence whether these standard systems can continue to enjoy the same degree of attention and importance as they have in the past.

SOLAR STORM
(Imagic/2600)

Here you are, back in the old space saddle again with Imagic's new entry for the Atari 2600, **Solar Storm.** This time your goal is to prevent a rain of cosmic debris from raising your planet's surface temperature to the point of explosion. At your disposal is a laser ship located at the bottom of the screen. Rotating the paddle control shifts the ship left and right, pressing the action button fires the laser.

Some of the enemies that drop down from the top of the screen fire back at your ship, others descend at shallow angles in an attempt to force you into a corner. The game ends when you lose all your laser ships or when the temperature of the planet below you is raised to the point of explosion.

Break a 500 point level and you're permitted to play a bonus round that lets you blast horizontally moving alien ships from an orbital platform located at the center of the screen. Rotating the paddle control aims the platform's laser at one of the four corners of the screen. Pressing the fire button shoots the torpedoes. The setup is similar to Atlantis. You have to time your shots from the center mounted platform to intercept the ship travelling at the edges of the screen. A bonus laser ship is awarded if five ships are blasted within the allotted amount of time, starting with ten seconds for the first bonus round and less for subsequent rounds.

I know, you're thinking another slide-and-shoot game. But Solar Storm is a well designed one, with some interesting twists of its own. The weaponry in this game is not your standard laser "missile," but rapid fire lines of light. The advantage to this is that your gun will fire as fast as you can press the button. The disadvantage is that, if you're under an enemy's laser when it is fired, then you can kiss your ship goodbye, because there's absolutely no time to dodge the beam. What with the rapid fire artillery and the unending rain of spaceships, solar flares and sunspots, speed is of the essence, making the paddle control a welcome change from the standard joystick. An added plus is that the dual temperature indicators for the planet's surface have been thoughtfully positioned to the sides of the screen, allowing you to focus on the battlefield while monitoring the planet's status via your peripheral vision.

The most disappointing aspect of

Solar Storm turns out to be the bonus round. Using the paddle control to select the four positions of the gun is inconvenient, with the gun sometimes oscillating between two positions if the paddle is not correctly set. With the exception of a couple of satellites orbiting the platform, there's not much to look at during these rounds, and the predictable movement of the targets doesn't help to keep this segment of the game from becoming extremely boring. In fact, the entire round doesn't seem to serve much more purpose than to be an unwelcome interruption to the major area of game play. In a game that is in other ways very well designed, this pointless detour is a definite drawback.

With or without the bonus round, Solar Storm still remains a good, gutsy

shoot-'em-up. I've no doubt it will find its audience in those reckless souls who live life in the fast lane, repeatedly snatching victory from the jaws of defeat. Sure, it's a lonely and perilous job, but somebody's gotta do it!

—D.P.

HALLOWEEN

(Wizard Video Games/2600)

Let's face it: Translating the movie **Halloween** into a video game may have been a lost cause from the word go. What made John Carpenter's superb little chiller so good were the types of things that cannot be readily captured in a game, such as brooding, subjective camera angles; appealing, plausible characterizations; bursts of humor; and a plot that goes from your standard mad-slasher setup to an unsettling rumination on the immortality of evil.

Well, don't expect to find any of this in Wizard Video's rendition. In this one-player game, your joystick controls a babysitter who is trying to protect a houseful of children from the mad attacks of Him. "Him" is a homicidal maniac in a Halloween mask (in the movie his name was Michael, but that's not mentioned in the instruction book). As in the movie, Him is immortal and practically omnipresent; he can turn up anytime, anywhere. The two-story, sixteen-room house that the characters occupy is set up similarly to the scaled-down version of the department store in Keystone Kapers.

Each screen depicts both stories, with one room visible on each. Walk the sitter off one end of the screen, and she reemerges in the next room from the opposite end. At each end of the house, on both stories, are "safe rooms," which are protected from attacks by Him. These rooms also contain doorways that transport you to the other story. You must guide your babysitter through the house, until you find a room that contains a child. Positioning your sitter above the child and pressing the action button activates your sitter's tractor beam (that's the best way I can describe it). You must now help your sitter drag the child to a safe room, where points are awarded for rescuing the tyke.

Needless to say, as you wander through the rooms, Him shows up with alarming frequency to menace both you and the children. The sitter is not completely defenseless, however. If she is not carrying a child, she can pick up a knife that is randomly located in one of the rooms of the house and strike back at the masked boogyman. Stabbing Him earns you points and sends Him running offscreen for a few seconds of relief. The house also contains rooms with "warp doorways," doors that, when entered, will skip you two rooms on a level. Other rooms on the second story have faulty wiring, with the room only briefly visible as lights flicker on and off—an obvious hazard. You start off with three lives. There are no bonus lives or player options in terms of difficulty of play.

There are a few good things about Halloween. I am grateful that, like the movie, the babysitter is not just some helpless victim. She has a means of defending herself. The graphics, while simple, are not bad. There are some ghoulishly funny touches, such as having the decapitated babysitter run frantically around the screen after being attacked by Him. (Bad taste lives!) Aside from that, Halloween turns out to be strictly a one-note game. Once you get the hang of rescuing the kids and stabbing the killer, there's not much to it. Game play speeds up after you rescue five children or stab Him twice, but that's the only variation provided and it's just not enough.

Halloween is good for a few nasty giggles, but over the long haul it's a bore. If, in spite of everything, you're still con-

sidering purchasing this game, there's one more thing that you should know. While the cartridge works fine on an Atari 2600, when we tested it on a ColecoVision equipped with the expansion module #1, it didn't play. While it's possible that the defect could have been in the cartridge provided us by Wizard Video, if you're buying the game to play on a ColecoVision, make sure that you can return it for either an exchange or a refund if things don't work out. *—D.P.*

THE TEXAS CHAINSAW MASSACRE

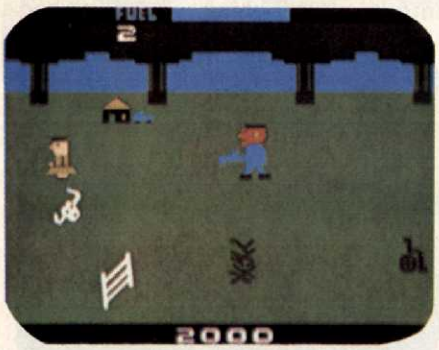
(Wizard Video Games/2600)

As a film, **The Texas Chainsaw Massacre** has been called many things, including upsetting, disturbing and frightening. However, I've never heard anybody refer to this king of splatter films as "boring." Somebody must have failed to tell the folks at Wizard Video Games, though. They've adapted The Texas Chainsaw Massacre as a game for the Atari 2600, and seem to have gone out of their way to turn it into a surefire soporific exercise.

In this one-player game your joystick controls Leatherface, a charming gent who comes equipped with the titular Texas chainsaw. You must maneuver him through a horizontally scrolling obstacle course of fences, wheelchairs, cow skulls and so on in pursuit of innocent tourists to hack up.

When you locate a victim (they're all female), she'll make a halfhearted attempt to escape. You chase her around for a bit and, when your chainsaw finally overlaps her body, you press the action

button. This revs the chainsaw which then. . . well, do I *really* have to tell you what happens next? Each victim that you dispatch earns you 1000 points (the guys at Wizard may be sick, but they're generous).



The chainsaw has a limited supply of fuel, indicated by a shrinking bar at the top of the screen. You start off with three tankfuls and get extra fuel for every 5000 points scored. When you have used up all three tanks, the game, mercifully, is ended.

The Texas Chainsaw Massacre doesn't seem to be anything more than a prototype that was prematurely yanked out of the development stage before anybody had a chance to iron the bugs out of it. To say that it needs some tweaking would be to put it mildly. The game play and graphics are monotonous, and the sound effects, which consist primarily of a shrill whistle when a victim appears, and what I suppose is the sound of a chainsaw chewing through flesh, are so inept that they don't even seem to be synchronized with the on-screen action. At 10,000 points everything speeds up, but even if Leatherface would travel at the speed of sound, the game would remain achingly dull.

—D.P.

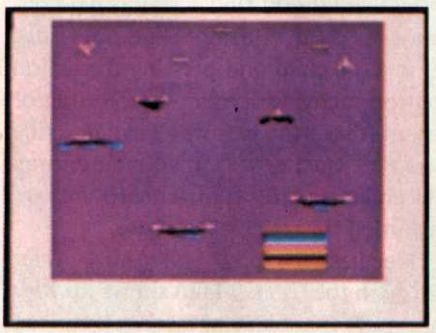
SWORDQUEST: FIREWORLD

(Atari/2600)

According to the comic book that accompanied this cartridge, I am in a land of erupting volcanoes, molten lava pits, and raging curtains of fire. There are two characters in the comic, a brother and sister who must battle firebirds, demons and dragons to achieve their goal. However, I only see one person on the screen, and the "tests" that I must undergo bear little resemblance to those described in the comic book.

My goal: It's either to find the Tree of Life or the Chalice of Light, or locate certain words concealed in the artwork of the comic book or win $150,000. How will I know when I've accomplished my task? I don't know, and neither the comic nor the vaguely worked instruction book gives any hints. What kind of game *is* this?

It's the kind of game that asks more questions than it answers. In **FireWorld**, the second installment in Atari's Swordquest series for the 2600 game system, the joystick manipulates your on-screen persona through a series of rooms connected by doorways. Press the action button while in a room and you're transported to one of six tests; minigames that might require you to dodge some sort of creature, shoot them or



catch. If you survive, for a certain length of time, you're then transported to a treasure room where you can pick up certain objects and leave others to receive clues, which take the form of page and frame numbers that relate to the comic book. Objects in your possession are shown at the bottom of the screen. You can't die, except perhaps of boredom, and the game is over when it's done, no doubt an arbitrary stopping point that I shall never see.

There's always a sense of trial and error in any adventure game. However, there's normally some sort of frame of reference, a way of relating the creatures and objects that are encountered to your own experience. This isn't the case with FireWorld. Carrying certain objects will get you through certain games, while leaving the correct objects in the right rooms will gain you clues, but there doesn't seem to be any criteria that you can use to determine which objects do what. I lay the blame for this vagueness on the concept of connecting the games in the Swordquest series with a contest.

Players who solve the FireWorld puzzle will be invited to compete for a very expensive, and gaudy, jewel-encrusted goblet. Since Atari isn't too anxious to receive several thousand correct entries, they have made the game as inscrutable as possible. This may make life easier for the contest judges, but for the poor gameplayer it results in a game that's more tedious than it is fun.

Perhaps, I would be more forgiving if the game play and graphics were intriguing enough. They aren't. The six minigames are ultimately boring. Some of them are so poorly designed that you don't even have to bother playing them to get into the treasure room. The graphics, at best, are just blocky compositions using some of the worst color combinations I have ever seen. At worst, the graphics make some of the minigames more difficult to play, since the targets that you're aiming for abruptly and inexplicably disappear into the background.

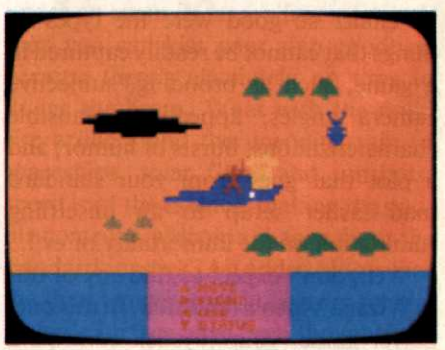
The idea of expanding a video game with a comic book is a good one. Atari proved it with Yar's Revenge. There's merit to the attempt to take the concept one step further and let the game interact with the comic book, so that both have to be continually used in order to achieve a goal. Unfortunately, the folks at Atari have failed by adding a contest with such high stakes that the designers were forced to make the game horrendously difficult. If you have your heart set on the goblet, then you might not mind all the drawbacks to FireWorld. If you're just out for a good time, then forget it.

—D.P.

DRAGONSTOMPER

(Starpath/2600)

This game for Starpath's Atari 2600 compatible Supercharger was originally to be called Excaliber. For reasons related to either the marketplace or the



courtroom, Starpath decided to change the name before release to **Dragonstomper** and it happens to be one of the best adventure games ever released for the 2600.

This one-player effort incorporated Starpath's Multi-Load feature which is utilized to divide the game into three sections. Each is loaded separately into the Supercharger from a cassette recorder and the majority of the screen shows a graphic representation of your surroundings. At the bottom of the screen is a message area, which either informs you of what creature is attacking, or provides you with "menus" of options that you can select by manipulating your joystick.

In the first part of the game, you, as the Dragonstomper, wander the enchanted countryside. As the scenery scrolls under your knight, represented by a small featureless cursor, you pick up objects such as axes and charms from the buildings that dot the land, while battle the dragon's henchmen, which take the form of ghouls, soldiers, beetles and other creatures. Then it's off to the village, where you barter for supplies and men using the items acquired during your wanderings.

The last section is in the dragon's cave. Here, after maneuvering through a vertically scrolling obstacle course of booby traps, you must vanquish the dragon, either by slaying the creature or by stealing its magic amulet to "rehabilitate" it. The Dragonstomper is not immortal. He starts with 23 units each of strength and dexterity. When all of his strength is gone, the game is over.

At first glance, Dragonstomper's visuals may lead you to think that this is another action/adventure game on the order of Haunted House or Superman. Actually, Dragonstomper plays more like a graphic-enhanced computer adventure. Little eye-hand coordination is needed for the first two-thirds of the game, while the last third, introduces a few action elements for variety in the dragon's cave. Instead of using arcade skills, the player must rely on trial and error, and the ability to learn not to repeat the mistakes of previous (failed) attempts to conquer the dragon.

I had feared that the joystick-operated menus would prove a nightmare, with my knight dying an untimely death because I tugged left when I should have jerked right. The system actually proved to be very well laid out and flexible. Computer adventurers will probably miss the freedom that a keyboard provides, but the joystick control for Dragonstomper is almost as good. Graphics and sound are ordinary. However, the booby traps in the dragon's cave are sprung with such a suddenness that I literally jumped from my seat. A nicely wicked touch. —*D.P.*

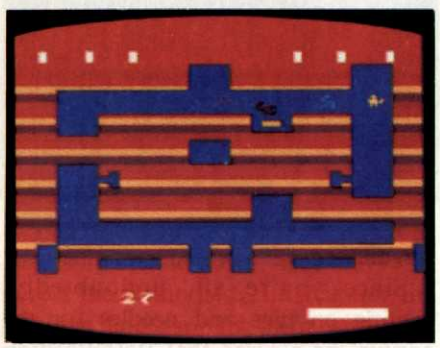
TUTANKHAM

(Parker Brothers/2600)

Parker Brothers and Atari seem to be in an endless race as to who can acquire the most arcade titles. The latter seems to have the knack for turning their licenses into reasonable facsimiles of their arcade counterparts, if not for the VCS, then certainly in the 5200 or 400/800 format. Parker Brothers has just begun to produce multiple formats for the sophisticated and popular hardware systems, so the balance may shift in the future. However, in the past except for Frogger, their translations of arcade games have been rather weak in comparison to the coin-op inspirations.

Tutankham for the VCS is no exception to this unfortunate rule. It hardly looks or plays like the exciting, graphically stunning original which can still be found in many game rooms across the land. But go beyond the graphics and this version holds up very well against most rival games for the VCS system. There are multiple screens in this cross between an adventure game, a lightning reflex shoot 'em up and a strategy contest.

Tut finds you controlling a stalwart Indiana Jones-type character bent on discovering the great treasure of an ancient Pharoah's tomb. He's armed with an automatic pistol and three bombs that will vaporize every foe on the screen. The automatic pistol has enough ammo to eliminate any worry about conserving bullets, although there is a gauge at the bottom that lets you know if you're getting too trigger happy. The bombs are set off by moving the joystick forward and firing.



There are four scrolling screen levels, each more difficult than the preceding one and containing several chambers laden with treasures. You must acquire a key before you can move from the first chamber to the next, and obstructing your quest are numerous, lethal creatures guarding the tomb. They emerge from nesting sites once they're disturbed by the appearance of an intruder. Although one shot of your weapon makes short work of any of them, they move very quickly and cannot be fired upon unless laterally positioned. Your gun, unfortunately, cannot fire up or down, or at a slant.

Once you get the key it's time to move on to the next lowest chamber. When retrieving it, keep firing because you must first go over a nest. Then, quickly grab the key and fire as you leave because the nest generates more creatures. Continue to move quickly while still firing and when you find yourself in a position where you're trapped by a creature coming above or below, use your bomb. Each time you complete a level you'll gain a bonus bomb and your ammo supply is completely replenished. Just remember to stay parallel to your attackers or your gun is useless.

Tutankham is for the most part an exciting, challenging game incorporating many successful video themes. The graphics, although not impressive, are about par for the VCS. It does merit praise for its variety of play and graphics, and does keep you involved as well as absorbed enough to have you coming back for more. It's just a shame it bears the name of an arcade predecessor that outshines it the way the glory of ancient Egyptian civilization eclipses what remains of that region today.

—*P.G.*

STRAWBERRY SHORTCAKE

(Parker Brothers/2600)

Here's an excerpt from the instruction booklet of **Strawberry Shortcake: Musical Match-Ups**, Parker Brothers' Atari 2600 compatible game cartridge: "Strawberryland™ is all mixed up—thanks to the Purple Pieman. ™ Strawberry Shortcake and her friends Blueberry Muffin™, Lime Chiffon™, and Huckleberry Pie™ were going to put on a talent show." I haven't seen so many stars in one place since my last round of Galaxian! All these ™'s designate

registered trademarks of the owners of Strawberry Shortcake, The American Greetings Corporation.

The goal of this one-player game is to unscramble the bodies of Strawberry Shortcake and her friends. One scrambled body appears on-screen within a pink gazebo. The player then uses the joystick to shift head, torso and leg portions around. When the correct parts have been assembled, a push of the action button starts the character's dance and his or her name appears at the bottom of the screen while a corresponding tune plays on the sound track.

Variations include games where the player must assemble a character chosen at random and identified by either its name or its signature tune.

Parker Brothers has genuinely gone out of its way to take into consideration the needs and limitations of the four-to-seven-year-old age group that Musical Match-ups is aimed for. In fact, the no-lose aspect of Strawberry Shortcake is one of the game's most appealing features. No scores are kept, letting a child derive satisfaction solely from the successful completion of the puzzle. If a correct character hasn't been assembled when the action button is pressed, the child is not greeted with a buzzer or some other frustrating sound effect. Instead, there's a tune played relating to the body parts on-screen.

An indirect advantage is that, once the player catches on that each tune is assembled from three parts associated with the character's head, torso, and feet, there's the opportunity to exercise a measure of personal creativity by composing brand new tunes assembled from deliberately jumbled body parts. The graphics are appealing, with bright colors and easily identifiable characters. Animation, however, is practically nonexistent. It appears that, in Strawberryland, "dancing" means merely wiggling your legs up and down in time to the music.

If the programmers didn't go overboard on movement, they have definitely outdone themselves on the sound track. Each of the five characters has their own theme song complete with two-part harmony. Such an achievement is no mean feat for anyone programming for the 2600. If Activision and Imagic have built their reputations on superb graphics, then Parker Brothers, between the use of the Star Wars theme in The Empire Strikes Back, the hushed, abstract sound effects of Reactor, and the lively tune-fest of Strawberry Shortcake: Musical Match-ups, is fast becoming the one to beat when it comes to sophisticated sound effects and music.

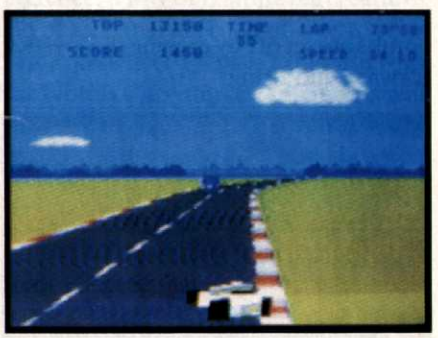
While it remains an issue whether four years olds can handle the play mechanics of Strawberry Shortcake: Musical Match-ups, I don't doubt that the bright graphics, cheerful tunes, and benign game play should keep most children entertained for quite awhile. I would suggest handling the cartridge with care, though. While young children seem to be immune to the effects of prolonged exposure to Strawberry Shortcake, more than a few adults have been struck down with cases of sugar shock.

—D.P.

POLE POSITION

(Atari/5200)

It's no secret that the most popular arcade game for the past five months has been Atari's enormously successful **Pole Position**, a truly great auto racing simulator. The question was not whether Atari would create a home version but, when it did, how would it stack up against its great quarter-gulping



originator.

Since you're all, undoubtedly, waiting on pins and needles for the answer, be assured that Pole Position for the Atari 5200 is without question the best auto racing game to ever grace a home television. The graphics and sound effects are simply superb. You can almost feel the car rattling when you're on the track's shoulder. You shift gears and accelerate with a feel that's so realistic you instinctively shield your eyes when crashing. True the graphics are not up to the level of the arcade counterpart, but they're miles ahead of every other home game of this genre.

Just as in the original you must first qualify to be eligible to race, with a fast time giving you the coveted Pole Position at the start. You begin in first gear but quickly must shift to second for maximum speed. Use actual auto racing techniques for this is a realistic simulator. Don't stay in one lane but use the whole road when turning, and downshift as well as ease off the accelerator when negotiating hairpins or you'll inevitably crash into one of those ill-placed road signs.

Stay off the shoulder, but use it if it means avoiding a crash. Passing can be dangerous especially when two cars are in front of you side by side. Slow up when faced with this situation by downshifting and releasing the accelerator button, but keep your eyes glued to their rear tailgates and then pass between them as soon as they break formation.

The only shortcomings of this remarkable game are the 5200 controllers. For once the joystick isn't the main culprit. Even though I much prefer a steering wheel and accelerator pedal a la Coleco's Turbo, the stick works well as a shifter and a steerer. By moving it forward you downshift, backward you shift up. Moving the stick from right to left turns your car. I can live with this: What I do loathe are those rubbery side buttons that are your accelerator. They're thumb torturers when they're held down for any length of time. Taking this into account, however, Pole Position still rates the winner's circle as the first place finisher in auto racing games.

—P.G.

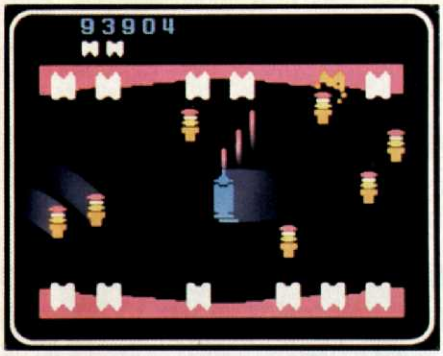
PLAQUE ATTACK

(Activision/2600)

With Activision's **Plaque Attack** you can plug this one-or two-player game into your 2600 and take preventive dentistry into your own hands, without even moving from your TV.

At the top and bottom of the screen are two sets of gums lined with teeth,

eight to begin with. As you use your joystick to maneuver your tube of toothpaste between the gums, the teeth come under attack by wave after wave of merciless foodstuffs, such as hot dogs, candy canes, and, yes, even strawberries. The toothpaste tube is invulnerable, but the teeth aren't.



If a tooth is touched by one of the munchies, it yellows and disappears. It is your job to prevent this mass destruction by using your limited amount of fluoride bombs to eliminate the edibles before they can reach your pearly whites. The toothpaste tube can move in any direction, but only fires up and down, depending upon which direction it was moving in last. Survive a wave, and you get bonus points for all the toothpaste and teeth remaining. Survive long enough and you get bonus teeth that either replace the teeth lost in the heat of battle, or are added to the left or the right of the original teeth, providing more targets for the aggressive edibles. The game ends when you lose all your teeth. There are two difficulty levels to choose from, as well as the option of a fast or slow firing toothpaste tube.

There's something about Plaque Attack that I find very appealing. Perhaps it's the idea of taking a couple of facts of life (too many sweets will rot your teeth; brushing with toothpaste is good for you), and translating them literally into an armed combat scenario. The imagery reminds me of those wacko dental hygiene films that we were shown in grade school. There are teeth: placid and defenseless. There's the toothpaste: strong, ever-vigilant. Zipping in from the sides of the screen comes the enemy: not abstract representations of cavity-causing bacteria, but donuts, ice-cream cones and triple-decker hamburgers.

The challenge is like that of Missile Command, only doubled. At higher levels of the game, both rows of teeth will be under attack at the same time. The game becomes a matter of not trying to save all of your teeth, but of trying to protect at least one tooth so that you can proceed to the next round. In military circles, this strategy would probably be known as losing a tooth in order to save a tooth.

The idea is novel, the strategy challenging, yet there is a sense of déjà vu about Plaque Attack. At its heart, it's another slide-and-shoot. Even the idea of being threatened by earthly, everyday objects rather than hostile alien forces was established in Activision's own Megamania. Yet, the concept is so loveable, and the execution so well done, that I can't really object to the game. It's both fun and funny, a rare and welcome combination.—*D.P.*

KILLER SATELLITES

(Atari/2600)

After Atari released their version of Defender for the 5200, who would bother rehashing the theme? Starpath, the manufacturer of the Atari 2600 compatible Supercharger, would. The problem is that, compared to the landers, swarmers, and mutants of Defender, the killer satellites of **Killer Satellites** are real creampuffs.

Okay, so maybe you're in the mood for French pastry. In Killer Satellites, a swarm of satellites has decided to exterminate the human race. It's up to you, in your lone laser ship, to protect Mother Earth. The satellites' technique is far less ominous than that of the aliens in Defender. Instead of trying to turn helpless humans into killer mutants, these satellites just try to bomb the dickens out of everything that's scattered across the bottom of the screen.

You use your joystick to fly your spaceship up and down, back and forth across the countryside, intercepting the satellites and zapping them with your lasers. Up top is a scanner to show you the location of satellites that are outside of the field of your main viewscreen. There's also a fuel indicator, since your ship will crash if it runs out of fuel, in addition to a laser overheat indicator since, if you fire too often, the lasers will shut down until they cool off.

In later waves, indestructible meteorites show up, turning outer space into an obstacle course. Bonus points are awarded according to how many ground objects are left standing and how much fuel you have left at the end of a wave. A bonus ship is awarded at every 10,000 point level.

The graphics are far better than those of the 2600 version of Defender. Unfortunately, the game play doesn't turn out to be as sophisticated as the visuals. This is a basic scrolling shoot-'em-up: satellites drop, you shoot them, the end. That's not bad, especially since, in the higher levels, the action can get fast and furious (and an experienced game player should exercise his index finger on the Game Select switch and start off at least at level five, since levels one through four are deadly dull).

But if you're used to the varied personalities and attack patterns of the aliens in Defender, you're going to be sorely disappointed with the uniform character of your adversaries in Killer Satellites. Even the scanner lacks detail, giving you only the horizontal position of the enemy while leaving out the vertical information that would allow you to line your ship up with your foes before they come on-screen.

On the plus side, the game is a good test of reflexes. The ship moves so fast that it requires a nimble hand on the joystick to keep from crashing into the various debris that litters the screen. I've even discovered what has to be the neatest trick of the month: Fly your ship towards a satellite until the two crafts are a hair's breadth apart. Make a quick U-turn, and the flaming exhaust of your spaceship will destroy the attacker.

In terms of depth and sophistication, I would still have to pick the Atari 2600 version of Defender over Killer Satellites, even though the graphics of Defender are decidedly inferior. However, if you're looking for a good basic shoot-'em-up cast in the Defender mold, Killer Satellites might be the way to go. It's good, but I think it could have been better.—*D.P.*

BOOK BEAT

COSMIC TALES
Video's Amazing Literary Effort

By Anne Krueger

Usually when you think of a portable video or electronic game, you think of those little hand-held efforts. You don't think of a book. But *Race Against Time with Mazewarps* (Clarkson N. Potter, Inc.) is a book that is a game. And it's nothing if not portable.

Written and illustrated by Vladimir Koziakin, the author of more than 45 other maze books, *Mazewarps* is just right for those times when you're looking for more diverse forms of video game action. To read/play, you need a sharp pencil, patience, a watch or some other kind of timing device (like the timer other *real* portable games have) and your thinking cap. You're then set for Koziakin's cosmic drama.

What makes this a video game book rather than just a slightly interrelated exercise is the incorporation of a little science fiction tale that goes along with the adventure. From page to page you must journey through 24 mazes, taking on the identity of Trax Videozap, commander of the ultra-fast spacecube. You're trying to save what Koziakin calls the "beautiful Venus 11-B from the clutches of the evil Dicto/Galaxis."

Now, I personally have a small bone to pick with this plot immediately. I'm a woman and don't know if I want to (or other female types will want to) play the part of Trax Videozap whose only goalis to save the scantily-clad Venus. She's not even my style. The orbiting control scout looks like she's dressed more a la Frederick's of Hollywood than in space-age garb. (Before this gets any of you too excited, I'd like to point out the illustrations are black and white line drawings and that you don't see much.)

If I try to be mature and overlook the gender problem I then come to the conflict which is this: Venus has the top-secret code used to "activate and deactivate the inviso-shield which encircles and protects mankind's intercosmic powersphere."

The villain Dicto/Galaxis is trying to torture the code out of Venus. To save her, Trax must make his way through the 24 Mazewarps. Each maze has a different rated time limit and a space is provided for you to fill in your time score (in seconds).

The mazes are in different configurations for variety and offer an array of "challenges" for Trax, such as asteroid showers, giant bacteria attackers, collapsed supernova, torpedoes, an astral cemetery (not a pleasant place to be), adioactive explosions and so on. All of the mazes are truly challenging and are hard to complete within the required time unless you're really into mazes. Anyone who likes this kind of puzzle would find the entire book fun.

At the game/book's conclusion, you then add up your score (using one of those *real* portable video games that have a built-in calculator). If you've guided Trax through the celestial dilemmas within the required 2,689 seconds (which equals less than 45 minutes according to my calculations), Venus lives. If not, Venus disintegrates. (Too bad.) Either way, 45 minutes is a record time for paying attention to most portable video games!

Unless you're a big erasing freak, this is not a book you'll "read" twice. For $2.50, though, it's the cheapest "video game" I've seen around. The sound effects, however, are up to you. ▲

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Favorite sequel game: _____

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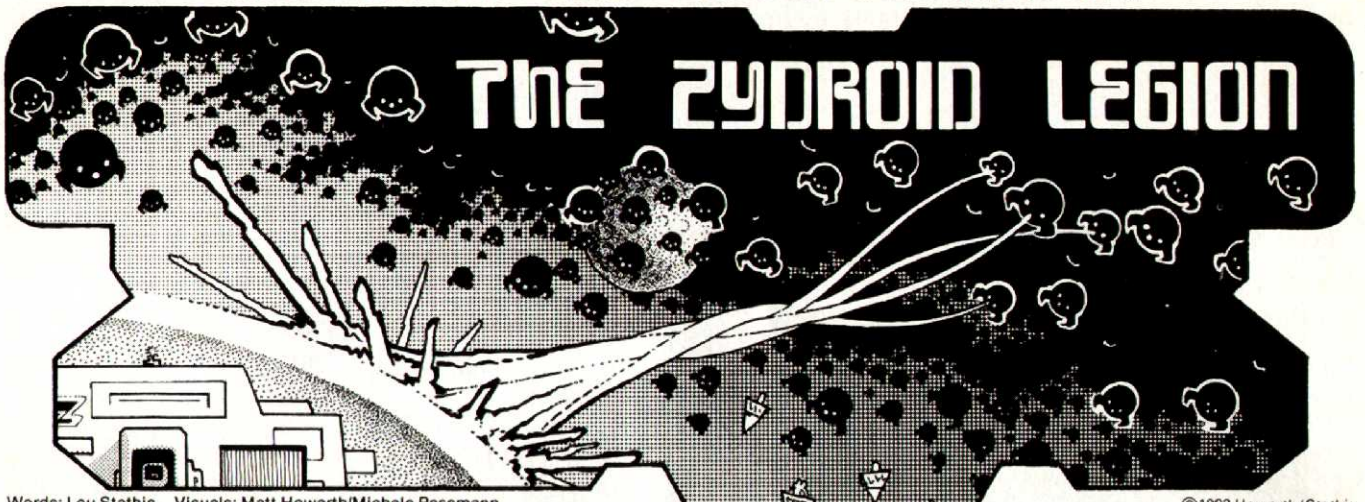
THE BLACK SHIPS OF ENTROPY HAVE SET THEIR SIGHTS ON ...



Words: Lou Stathis Visuals: Matt Howarth/Michele Passmann

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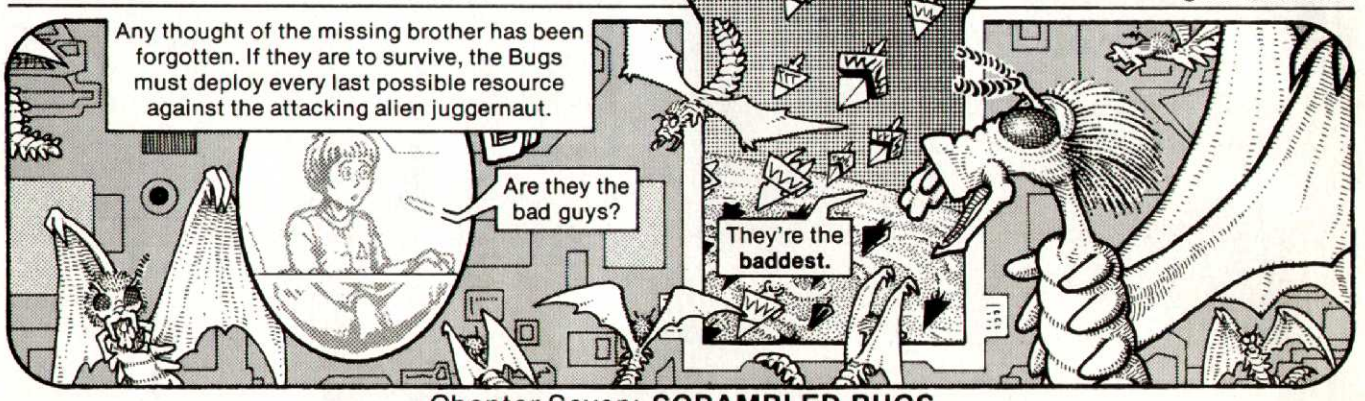
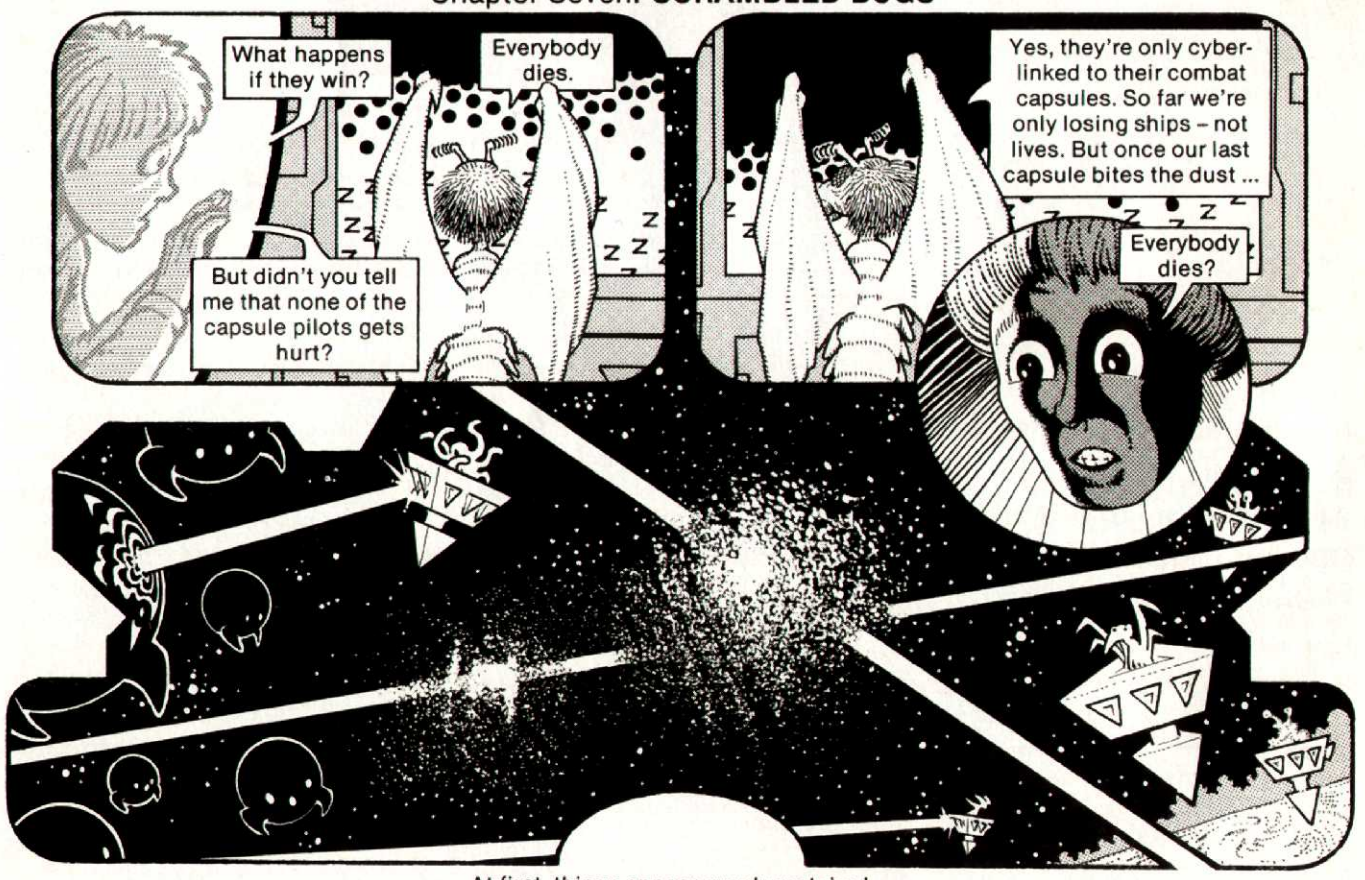
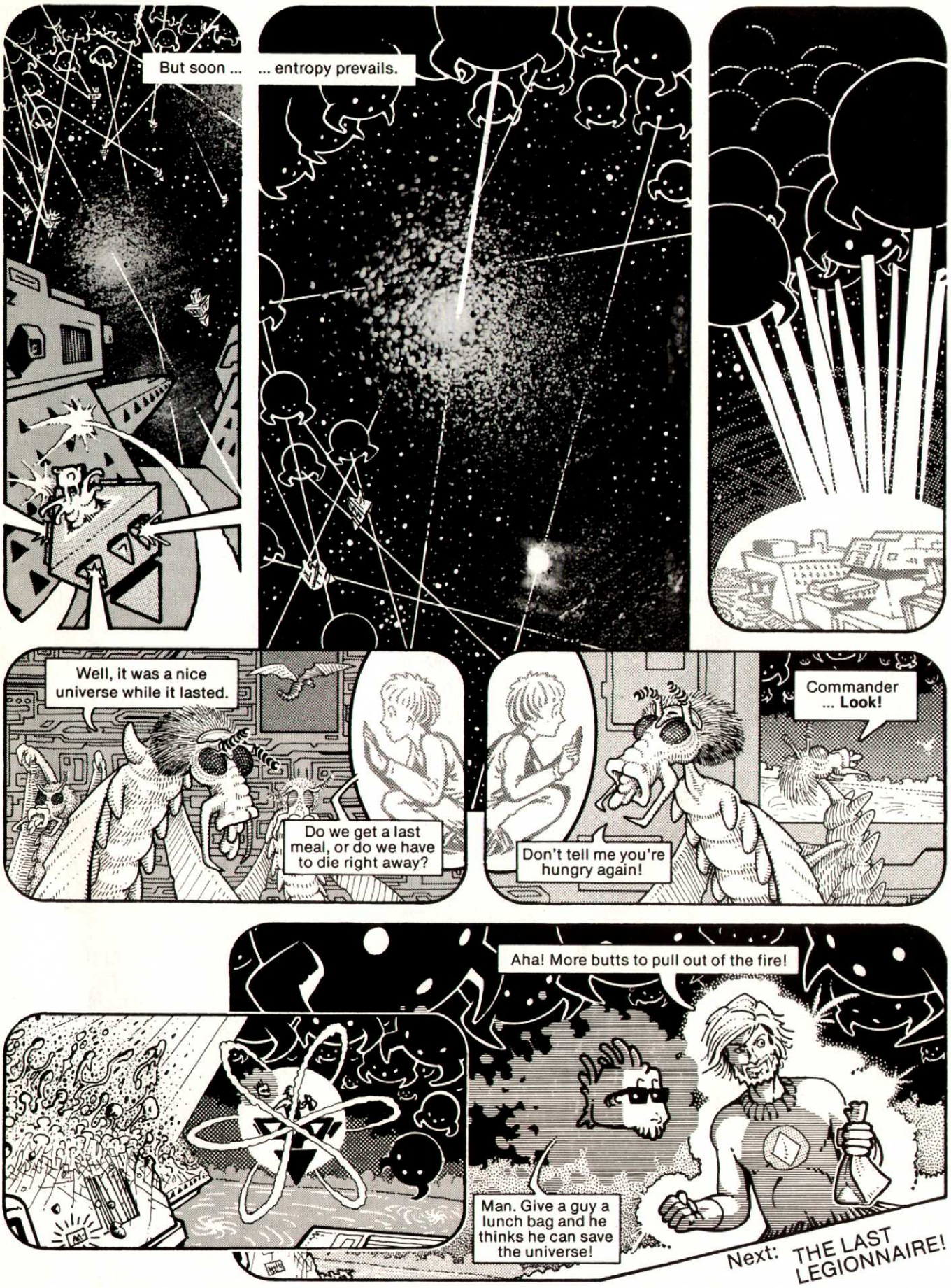


Chapter Seven: **SCRAMBLED BUGS**



At first, things appear evenly matched ...


But soon ...
... entropy prevails.
Well, it was a nice universe while it lasted.
Do we get a last meal, or do we have to die right away?
Commander ... Look!
Don't tell me you're hungry again!
Aha! More butts to pull out of the fire!
Man. Give a guy a lunch bag and he thinks he can save the universe!
Next: THE LAST LEGIONNAIRE!

STATS

Top Ten Home Games

Present Position 8/20/83	Last Position 8/6/83	Weeks on Chart	Game
1	1	11	Enduro (Activision)
2	2	21	Centipede (Atari)
3	3	25	Ms. Pac-Man (Atari)
4	4	15	Keystone Kapers (Activ.)
5	5	49	Frogger (Parker Bros.)
6	9	5	Robot Tank (Activision)
7	15	5	Jungle Hunt (Atari)
8	14	7	BurgerTime (Intellivision)
9	8	23	Donkey Kong Jr. (Coleco)
10	10	7	Galaxian (Atari)

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Top Arcade Games

	Percentage
*1. Dragon's Lair (Cinematronics)	100.0
2. Star Wars (Atari)	87.8
3. Pole Position (Atari)	81.1
4. Star Trek (Sega)	66.7
5. Xevious (Atari)	58.4
6. Q*bert (Gottlieb)	58.0
7. Time Pilot (Centuri)	57.3
8. Turbo (Sega)	57.2
9. Gyruss (Centuri)	56.5

*Conditionally rated—less than 50% response rate.

Provisionally rated

1. Krull (Gottlieb)	76.1
2. Crystal Castle (Atari)	73.0
3. Congo Bongo (Sega)	57.5
4. Sinistar (Williams)	57.5
5. Buck Rogers (Sega)	55.8
6. Mario Brothers (Nintendo)	55.2

These are the top earning arcade games according to a poll of operators. Those with asterisks indicate operator responses were between 25-50 percent. © 1983 by Play Meter Magazine

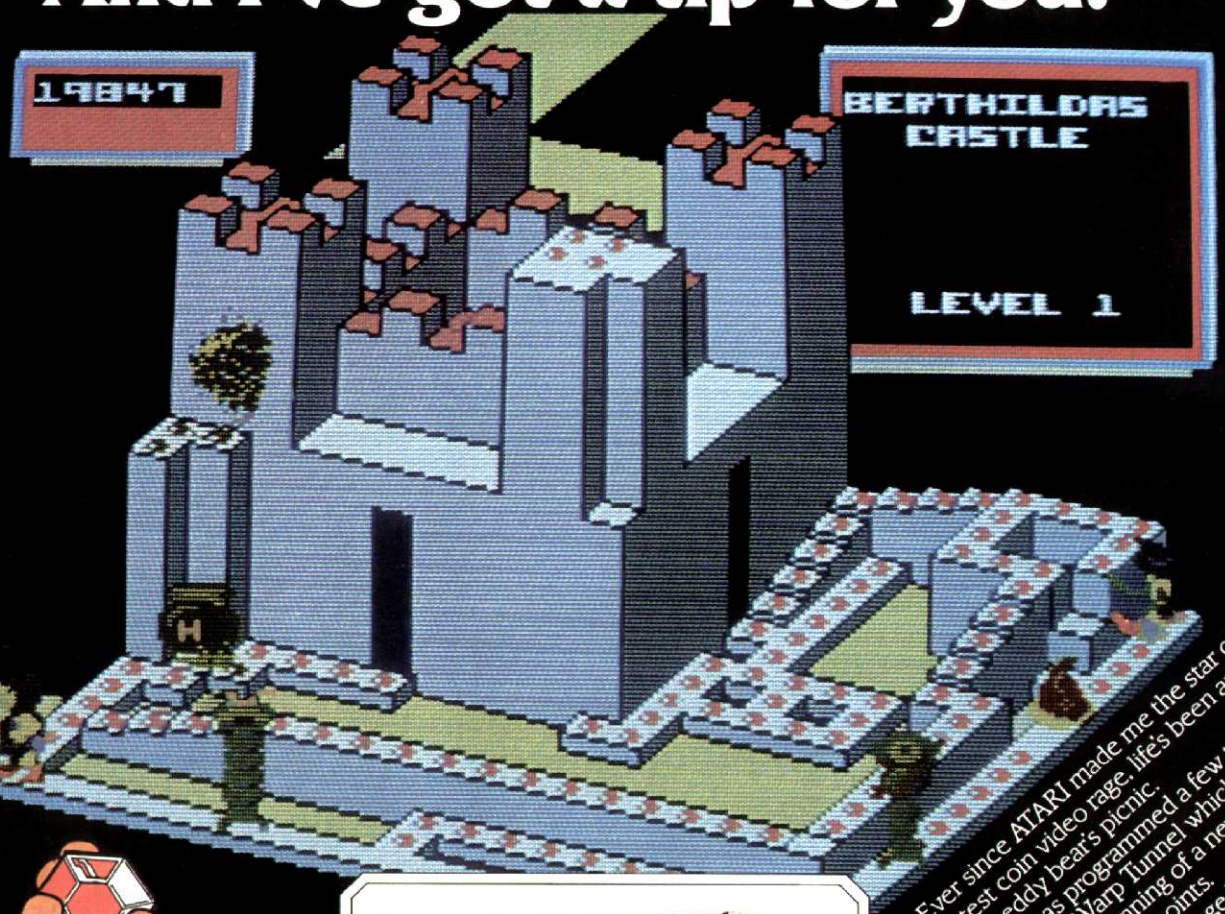
HIGH SCORERS

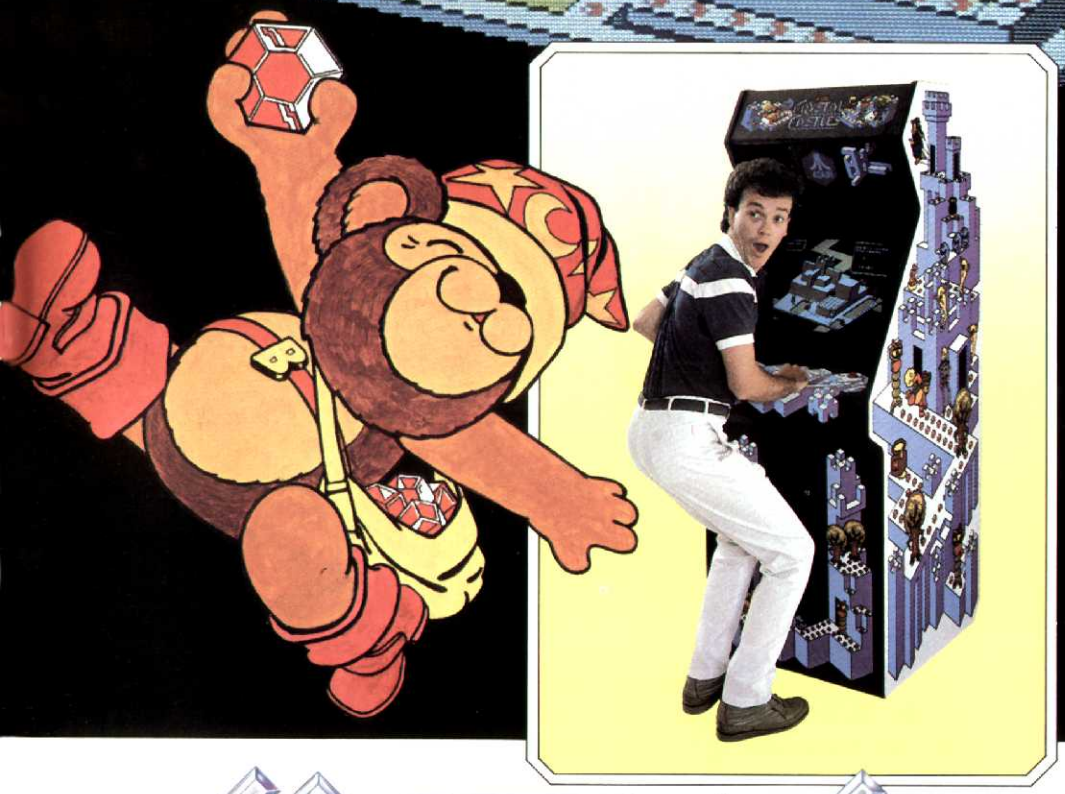
(effective 8/18/83)

Baby Pac-Man	6,685,130	Richard Sattilaro Edison, N.J.
Bagman	3,333,330	Tie: Mark Robichek Mountain View, Calif. Paul Lagrou Moscow, Idaho
Buck Rogers	731,030	Bruce Borsato Trail, B.C. Canada
BurgerTime	5,663,220	Tom Sher San Francisco, Calif.
Centipede	15,345,789	Rod Maddox Kokomo, Ind.
Crystal Castles	777,217	Eric Ginner Milpitas, Calif.
Champion Baseball	100,690	Gus Papas Upland, Calif.
Defender	76,377,300	Bert Jennings Durham, North Carolina
Dig Dug	4,129,600	Ken Arthur Blacksburg, Va.
Donkey Kong Jr.	957,300	Bill Mitchell Ottumwa, Iowa
Dragon's Lair	454,974	Steve Harris No. Kansas City, Missouri
Food Fight	12,231,500	Scott Shrewsbury Sandy Springs, Ga.
Frenzy	4,804,540	Mark Smith Shelby, No. Carolina
Frontline	727,500	John Dunlea Wilmington, No. Carolina
Gorf	2,220,000	Jason Smith Midland, Tx.
Gravitar	4,722,200	Raymond Mueller Boulder, Colo.
Gyruss	4,067,000	Tony Salisbury Salisbury, Md.
Guzzler	431,108	Mike Klug San Jose, Calif.
Joust (new chip)	101,192,900	Robert Gerhardt Lloyd Minster, Alberta, Can.
Jungle Hunt/King	1,510,220	Michael Torcello East Rochester, N.Y.
Journey	10,000,125	Joe Maurizi St. Clairsville, Ohio
Liberator	3,016,010	Sean Middleton Anchorage, Alaska
Lost Tomb	1,210,460	John Marks Parkersburg, W. Va.
Millipede	4,304,549	Ben Gold Stockton, Calif.
Moon Patrol (7 cars)	1,214,600	Mark Robichek Mountain View, Calif.
Ms. Pac-Man	419,950	Tom Asaki Ottumwa, Iowa
Munch Mobile	2,035,540	Ivan Luengas No. Miami Beach, Fla.
Motorace U.S.A.	1,219,400	Steve Harris Ottumwa, Iowa
Nibbler	838,322,160	Tom Asaki Bozeman, Montana
Pac-Man Plus	3,203,580	Doug Perking Dallas, Tx.
Pengo (4 men)	809,990	Kevin Leisner Racine, Wisc.
Pole Position (4 laps)	66,710 E.T. 215.71	Tie: Less Lagier, Mike Klug San Jose, Calif.
Popeye	1,131,360	Steve Harris Ottumwa, Iowa
Q*bert	24,079,950	Divelle Dorris Lake Park, Fla.
Quantum	1,029,160	Judd Boone Moscow, Idaho
Robotron	325,325,325	Robert Bonney Kirkland, Wash.
Satan's Hollow	43,086,600	Aaron Samuel Moscow, Idaho
Star Trek	46,330,500	Gary Hatt Upland, Calif.
Super Pac-Man	588,430	John Azzis Santa Maria, Calif.
Star Wars (6 shields)	1,461,042	John Sebring Santa Maria, Calif.
Time Pilot	4,134,400	Bill Bradham Dubland, Ga.
Xevious	999,990	Tim Williams Moscow, Idaho
Zoo Keeper	9,574,020	Eric Clayburg Fredericksburg, Va.

Our thanks to Walter Day Jr., of Twin Galaxies International Scoreboard (226 East Main St., Ottumwa, Iowa 52501). Readers who think they might have a high score should send a self-addressed, stamped envelope to Walter Day who will forward the necessary information and forms. Cities given are the locations where the high scores were achieved.

"The name's Bentley Bear™. And I've got a tip for you."





Ever since ATARI made me the star of their latest coin video rage, life's been anything but a teddy bear's picnic.

Luckily, Atari has programmed a few tricks to help me—like the Warp Tunnel which lets me jump ahead at the beginning of a new game and gives you big bonus points.

And since I'm cagier than the average bear, let me sneak you a few more hints right now:

In level 1, get me to the back corner of the maze and press "Jump". That'll take me to level 3 where you can do the same thing—only this time I must be wearing the magic hat to jump to level 5. Now you must wait until the 3rd maze of level 5 before another secret warp can blast me off to level 7.

So take it from me. . . with these tips, you'll be a winner, too!

ATARI®

CRYSTAL CASTLES™

New from Atari coin video games.

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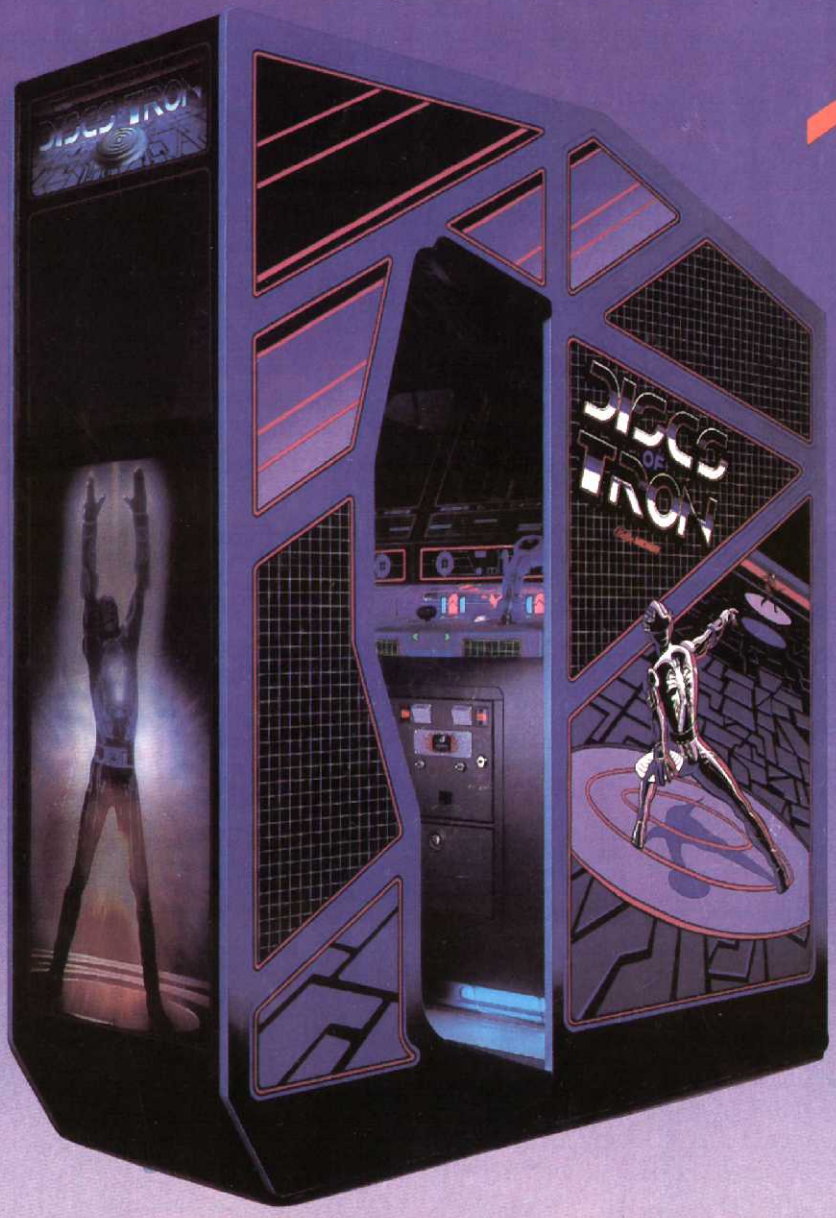
DISCS OF TRON

ENTER THE ENVIRONMENT



"GREETINGS, MASTER CONTROL PROGRAM HAS CHOSEN YOU TO SERVE ON THE GAME GRID."

With this command comes the ultimate challenge. You will be head to head with the awesome adversary—Sark. Enter the environment. Step onto the rings. Experience the dimensions of a computer arena.

"WE'LL GET YOU... IT'S ONLY A MATTER OF TIME."

Bally MIDWAY T.M.